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# Think Math!

## Extension Book



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# Think Math!

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# Introducing Magic Squares

The first grid is not a **magic square**. Change some of the numbers so that the sum of each row, column and diagonal is the same number. Change no more than two numbers.

1

			18
2	1	5	8
9	6	3	18
7	8	10	25
18	15	18	18


2

			21
6	12	3	21
3	7	8	18
11	2	8	21
20	21	19	21


3

			27
8	11	5	24
6	9	12	27
13	5	10	28
27	25	27	27


# Adding Magic Squares

**A**

	9	
	7	3
6	5	

**B**

12		
13	11	
	15	10

**A + B**

16		
		12

**A + B**

		12

**C**

9		7
4		8
		3

**(A + B) + C**


**B**

12		
13	11	
	15	10

**C**

9		7
4		8
		3

**B + C**


**A**

	9	
	7	3
6	5	

**B + C**

		17

**A + (B + C)**


# Subtracting Magic Squares

**A**

25	24	29
	26	
	28	27

**B**

16	17	
	15	19
		14

**A - B**

5		

**A - B**

5		

**C**

6		
2	9	4

**(A - B) - C**


**B**

16	17	
	15	19
		14

**C**

6		
2	9	4

**B - C**

	10	

**A**

25	24	29
	26	
	28	27

**B - C**

	10	

**A - (B - C)**




# Make a Magic Square

Use each of the given numbers once to create a magic square.

❶ 1, 2, 3, 4, 5, 6, 7, 8, 9


❷ 3, 4, 5, 6, 7, 8, 9, 10, 11


❸ 6, 7, 8, 9, 10, 11, 12, 13, 14


❹ 1, 3, 5, 7, 9, 11, 13, 15, 17


# Dividing Magic Squares by Numbers

Fill in the missing number in each sentence.

1  $42 \div 6 \times 6 \div 7 = \square$

2  $56 \div 7 \times 7 \div 8 = \square$

3  $72 \div 8 \times 8 \div 9 = \square$

Can you find a shortcut to solve one of these problems? Pick a problem and describe how you would solve it using your shortcut.

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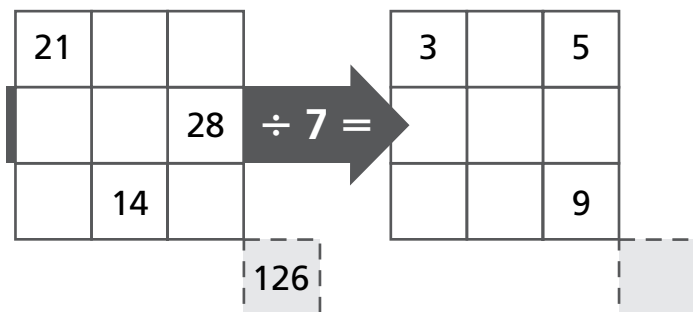
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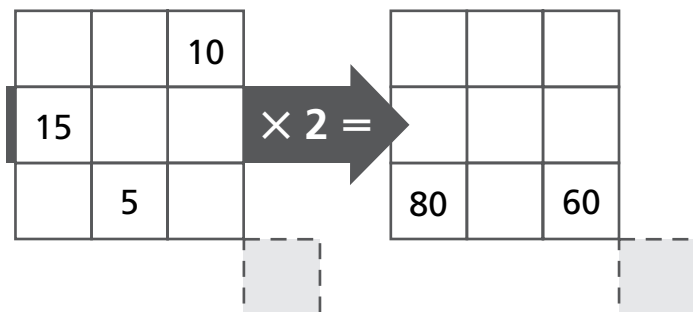
# Working Backward and Forward

Complete the magic squares.

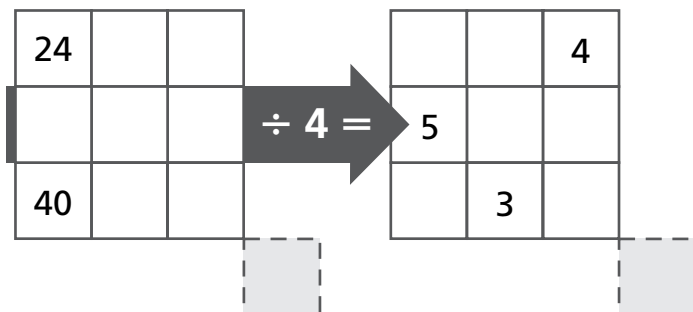
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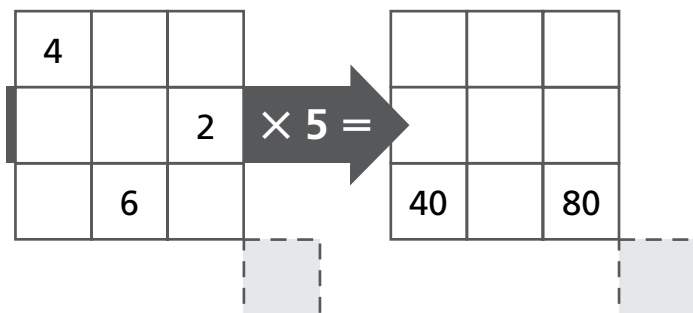
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3



4



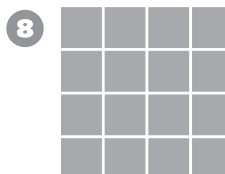
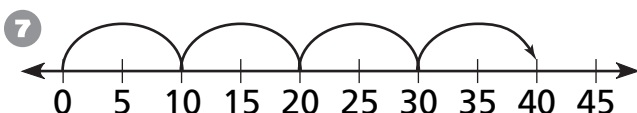
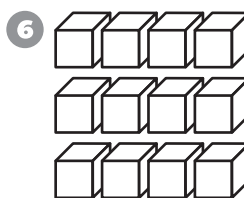
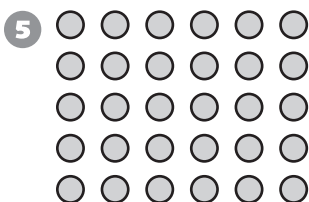
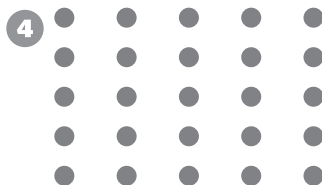
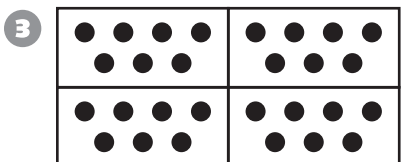
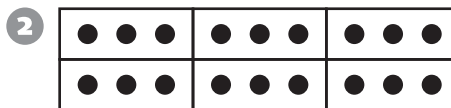
# Introducing Arrays

**Write the fact family for each diagram.**  
**The first one is done for you.**



$$3 \times 9 = 27, 9 \times 3 = 27$$

$$27 \div 9 = 3, 27 \div 3 = 9$$



- 9 How does the number of sentences in a fact family with 2 identical factors compare to the number of sentences in a fact family with 2 different factors?

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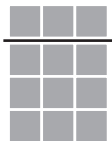
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# Separating Arrays

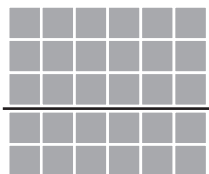
Find the total number of tiles in each array.

**1**

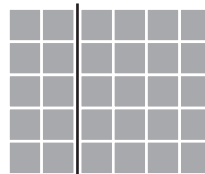
$$(1 \times 3) + (3 \times 3) = 3 + 9 = \boxed{\phantom{00}}$$

**2**

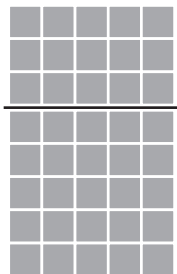
$$(4 \times 2) + (4 \times 1) = 8 + 4 = \boxed{\phantom{00}}$$

**3**

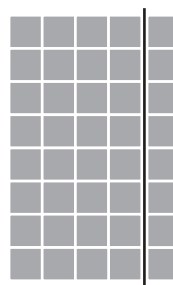
$$(3 \times 6) + (2 \times 6) = \boxed{\phantom{00}} + \boxed{\phantom{00}} = \boxed{\phantom{00}}$$

**4**

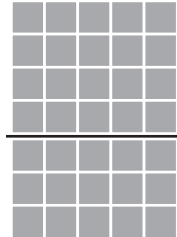
$$(5 \times 2) + (5 \times 4) = \boxed{\phantom{00}} + \boxed{\phantom{00}} = \boxed{\phantom{00}}$$

**5**

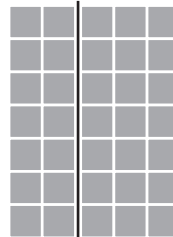
$$(3 \times 5) + (5 \times 5) = \boxed{\phantom{00}} + \boxed{\phantom{00}} = \boxed{\phantom{00}}$$

**6**

$$(8 \times 4) + (8 \times 1) = \boxed{\phantom{00}} + \boxed{\phantom{00}} = \boxed{\phantom{00}}$$

**7**

$$(4 \times 5) + (3 \times 5) = \boxed{\phantom{00}} + \boxed{\phantom{00}} = \boxed{\phantom{00}}$$

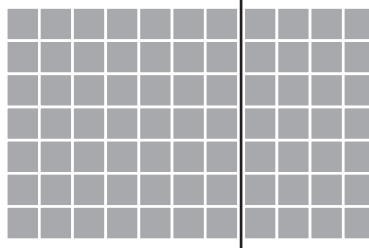
**8**

$$(7 \times 2) + (7 \times 3) = \boxed{\phantom{00}} + \boxed{\phantom{00}} = \boxed{\phantom{00}}$$

# Adding Array Sections

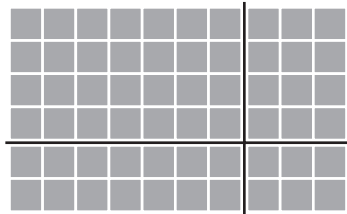
Write the multiplication sentence shown by each part of the array. Find the sum of all the parts to find the total number of squares in the array.

1



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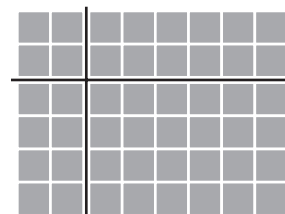
2



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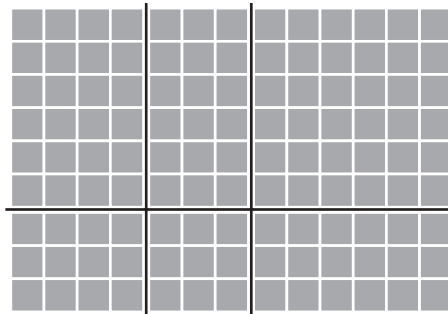
3



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4

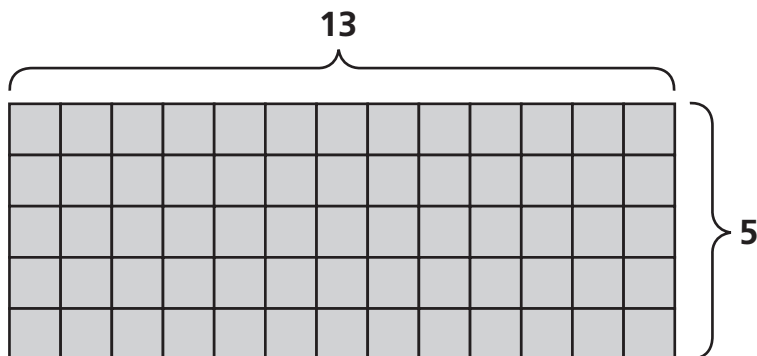


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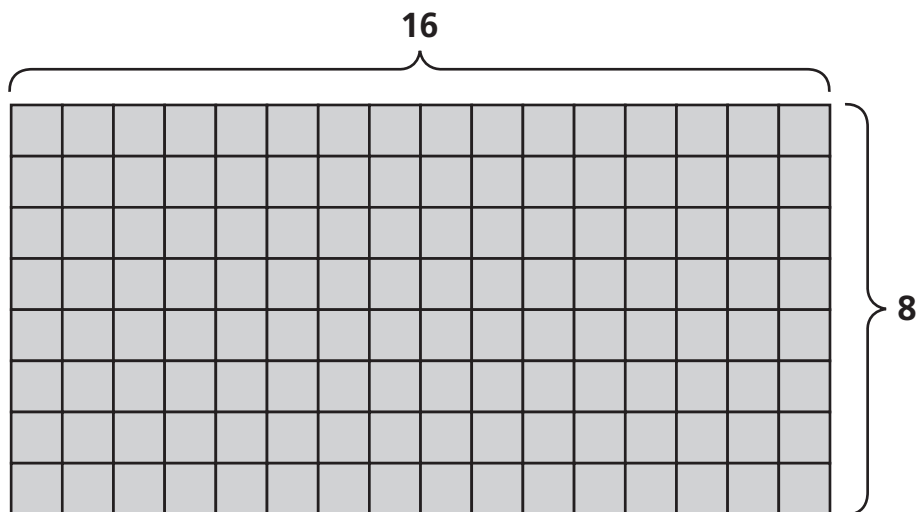
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# Exploring a Multiplication Shortcut

Find the number of squares in each array.

**1**

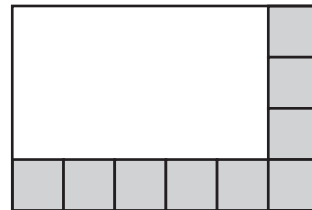
$$5 \times 13 = \square$$

**2**

$$8 \times 16 = \square$$

# Using a Multiplication Shortcut

**For Problem 1, use the figure.**



① Number of rows in the figure \_\_\_\_\_

Number of columns in the figure \_\_\_\_\_

Number of rows + Number of columns \_\_\_\_\_

Complete the drawing.

How many small squares in all? \_\_\_\_\_

Two numbers that have a sum of 10 and a product of 24 are \_\_\_\_\_ and \_\_\_\_\_.

---

**For Problems 2–8, find two numbers that have**

② a product of 30 and a difference of 7 \_\_\_\_\_ and \_\_\_\_\_

③ a product of 45 and a difference of 4 \_\_\_\_\_ and \_\_\_\_\_

④ a product of 60 and a difference of 4 \_\_\_\_\_ and \_\_\_\_\_

⑤ a product of 36 and a sum of 12 \_\_\_\_\_ and \_\_\_\_\_

⑥ a product of 25 and a difference of 0 \_\_\_\_\_ and \_\_\_\_\_

⑦ a product of 4 and a sum of 4 \_\_\_\_\_ and \_\_\_\_\_

⑧ a product of 18 and a sum of 11 \_\_\_\_\_ and \_\_\_\_\_

---

⑨ Create a product-and-sum or product-and-difference puzzle. Exchange with a partner and solve.

\_\_\_\_\_

\_\_\_\_\_



# Connecting Multiplication and Division

- 1 Find the three numbers that are common to both lists.

\_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_

A: 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54 57 60 63 66 69 72

B: 21 28 35 42 49 56 63 70 77 84 91 98

I multiplied my secret number by several other numbers and got 21, 42, and 63. My secret number is greater than 1 and less than 10. There is more than one possibility. What could my secret number be?

My secret number could be \_\_\_\_\_ or \_\_\_\_\_.

---

- 2 Find the number that is common to all lists. \_\_\_\_\_

A: 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44

B: 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

C: 16 24 32 40 48 56 64 72 80 88 96

I multiplied my secret number by another number and got 40. My secret number is greater than 1 and less than 10. There is more than one possibility. What could my number be?

My secret number could be \_\_\_\_\_ or \_\_\_\_\_ or \_\_\_\_\_.

---

- 3 I multiplied several numbers by my secret number and got 24, 36, 54. If my secret number is greater than 1, what is my secret number? There is more than one possibility.
- 

- 4 I multiplied several numbers by my secret number and got 36, 48, and 60. How many possibilities can you find for my secret number? What are they?
-

# Arrays with Leftovers

**I divided some numbers by a secret number.  
Each table shows a different pattern. Find the  
secret number in each case.**

<b>1</b>	<b>Number divided</b>	9	17	23	35	41	45
	<b>Remainder</b>	1	1	1	1	1	1

My secret number is \_\_\_\_\_.

<b>2</b>	<b>Number divided</b>	18	22	34	40	59	67
	<b>Remainder</b>	8	2	4	0	9	7

My secret number is \_\_\_\_\_.

<b>3</b>	<b>Number divided</b>	12	14	16	21	35	39
	<b>Remainder</b>	0	2	0	1	3	3

My secret number is \_\_\_\_\_.

<b>4</b>	<b>Number divided</b>	15	20	25	30	35	40
	<b>Remainder</b>	3	2	1	0	5	4

My secret number is \_\_\_\_\_.

<b>5</b>	<b>Number divided</b>	19	22	25	28	31	34
	<b>Remainder</b>	1	1	1	1	1	1

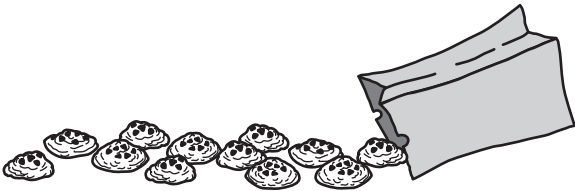
My secret number is \_\_\_\_\_.

<b>6</b>	<b>Number divided</b>	23	28	35	41	46	51
	<b>Remainder</b>	3	3	0	1	1	1

My secret number is \_\_\_\_\_.

# Working with Remainders

**Sammy brought fewer than 21 cookies to share with friends. He put some on the table. The rest are in the bag.**



- 1** Sammy shared his cookies equally with 4 friends. Some cookies were left over.

Number of cookies	13	14	15	16	17	18	19	20
Left over	3	4	0	1	2	3	4	0

When you divide by 5, what remainders are possible? \_\_\_\_\_

- 2** Sammy shared his cookies equally with 6 friends. Some cookies were left over.

Number of cookies	13	14	15	16	17	18	19	20
Left over	6	0	1	2	3	4	5	6

When you divide by 7, what remainders are possible? \_\_\_\_\_

- 3** What remainders are possible when you divide by the following numbers?

- A. by 2 \_\_\_\_\_
- C. by 4 \_\_\_\_\_
- B. by 3 \_\_\_\_\_
- D. by 6 \_\_\_\_\_

- 4** Make up a rule that tells what remainders are possible for any divisor.

\_\_\_\_\_

\_\_\_\_\_

# Save on Packaging

The Eraser Store sells packs of 7 erasers; boxes of  $7 \times 7$ , or 49 erasers; and crates of  $7 \times 7 \times 7$ , or 343 erasers.

The owners of the Eraser Store always use the fewest packs, boxes, and crates possible. Loose erasers are wrapped separately.

For example, if they have to ship 121 erasers, they would ship 2 boxes, 3 packs, and 2 loose erasers for a total of 7 containers.

**For each shipment, write the least number of containers that would be needed. The first one has been started for you. Use it as a model to complete the others.**

	Erasers to be Shipped	Number of Crates	Number of Boxes	Number of Packs	Number of Loose Erasers	Total Number of Containers
1	180	0	$3 \times 49 = 147$ That's 3 boxes.	$4 \times 7 = 28$ That's 4 packs.	5 Wrap 5 erasers.	
2	50					
3	125					
4	350					
5	1,000					
6	672					
7	800					
8	599					

# The Corrector

The Eraser Store is still shipping 7 erasers to a pack, 7 packs to a box, and 7 boxes to a crate. Employees at the store sometimes use too many containers. It is the job of the Corrector to make changes so that the fewest containers are used.

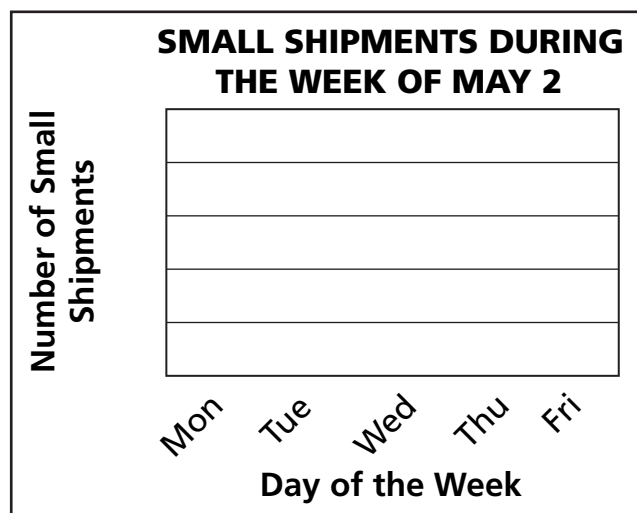
For example, an employee might pack 65 erasers in 1 box and 1 pack. There would be 9 erasers left. Your job as Corrector is to show that 7 of those 9 erasers could be put into another pack. Then the 65 erasers would be correctly packed in 1 box and 2 packs, with 2 loose erasers. So, only 5 containers would be needed, instead of 11 containers. (Remember, each loose eraser is wrapped separately.)

**For each shipment, decide whether the least number of containers was used. Circle the ones in which a mistake was made. Then make the corrections.**

	Number of Erasers to Ship	Number of Crates	Number of Boxes	Number of Packs	Number of Loose Erasers
1	60	0	1	1	4
2	72	0	1	2	9
3	51	0	1	0	2
4	105	0	2	0	7
5	96	0	1	5	12
6	400	1	1	1	1

# Charting Shipments

Suppose you were in charge of shipments for the Eraser Store last week. Make up data for the bar graph shown below. Number the vertical axis in a way that seems reasonable. Draw bars for each day of the week using the scale on the vertical axis.



**For 1–3, use your bar graph.**

- 1 Were the number of shipments the same on any days?  
If so, on which days were the numbers of shipments the same?

\_\_\_\_\_

- 2 What was the difference between the greatest number of shipments and the least?

\_\_\_\_\_

- 3 Between which two days was the difference in the number of shipments the greatest? Between which two days was the difference the least?

\_\_\_\_\_

# Changing Orders

Sometimes customers change the orders they place with the Eraser Store. When that happens, it is necessary to add or subtract erasers from an order.

**Follow the directions to show how you would change each order. Then describe how each final shipment would be packed. Remember that there are 7 erasers in a pack, 7 packs in a box, and 7 boxes in a crate.**

① Original order:  — • • • • \_\_\_\_\_ erasers

Change in order: Remove — — • \_\_\_\_\_ erasers

Trade 1 box for \_\_\_\_\_ packs:

 → \_\_\_\_\_ (Show shorthand.)

So, you have — — — — — • • • •

Now, remove the erasers and combine what is left:

There are \_\_\_\_\_ erasers left.

② Original order:    — — — — \_\_\_\_\_ erasers

Change in order: Add: — — — • • • • \_\_\_\_\_ erasers

Now, combine using the fewest containers:

There are \_\_\_\_\_ erasers.

# Incorrect Shipments?

The Eraser Store now packs erasers by tens. The shipments below are described using pictures.

**For 1–6:**

**A** Write the number of erasers in the shipment.

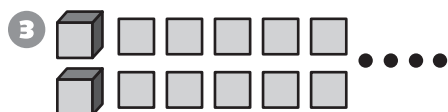
**B** Then decide whether the shipment is packed using the least number of containers. If it is, write yes. If it is not, write how the shipment should be repacked to use the least number of containers.



A \_\_\_\_\_ erasers      B \_\_\_\_\_



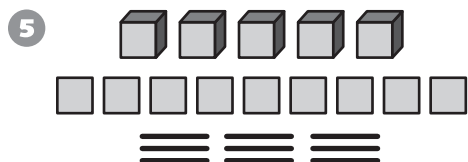
A \_\_\_\_\_ erasers      B \_\_\_\_\_



A \_\_\_\_\_ erasers      B \_\_\_\_\_



A \_\_\_\_\_ erasers      B \_\_\_\_\_



A \_\_\_\_\_ erasers      B \_\_\_\_\_



A \_\_\_\_\_ erasers      B \_\_\_\_\_



# Multiple Shipments

The erasers are still packed by tens.

For 1–4:

**A** Find the total number of erasers to be shipped.

**B** Show how the erasers should be packed using the least number of containers.

**1** 3 shipments of

**B**



**A** \_\_\_\_\_ erasers in 3 shipments

**2** 5 shipments of

**B**



**A** \_\_\_\_\_ erasers in 5 shipments

**3** 2 shipments of

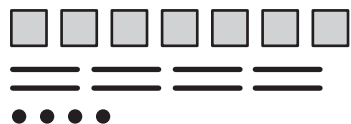
**B**



**A** \_\_\_\_\_ erasers in 2 shipments

**4** 4 shipments of

**B**



**A** \_\_\_\_\_ erasers in 4 shipments

# Sharing Erasers

At the beginning of the school year, the Eraser Store sent erasers to different schools. Each school divided its erasers evenly among the grades.

**For each grade shown below:**

**A** Find the number of erasers each grade received in each school.

**B** Show how each grade will receive its erasers using the least number of containers.

**1** 3 grades sharing

**B**



**A** \_\_\_\_\_ erasers for each grade

**2** 4 grades sharing

**B**



**A** \_\_\_\_\_ erasers for each grade

**3** 6 grades sharing

**B**



**A** \_\_\_\_\_ erasers for each grade

**4** 8 grades sharing

**B**




**A** \_\_\_\_\_ erasers for each grade

# Recording Multiplication and Division


Complete. Then show how the product or quotient should be packed using the fewest containers. You may use C to represent a crate.

1




$$\begin{array}{r} \overline{\phantom{0000}} \\ 4 \overline{) 1,072} \end{array}$$

2




$$\begin{array}{r} 1,025 \\ \times \phantom{0000} 6 \\ \hline \end{array}$$

3




$$\begin{array}{r} 793 \\ \times \phantom{0000} 8 \\ \hline \end{array}$$

4




$$\begin{array}{r} \overline{\phantom{0000}} \\ 6 \overline{) 3,366} \end{array}$$

5



$$\begin{array}{r} 1,314 \\ \times \phantom{0000} 3 \\ \hline \end{array}$$

6







$$\begin{array}{r} \overline{\phantom{0000}} \\ 7 \overline{) 0,756} \end{array}$$

# Missing Commas





Complete each problem. Then show how each order would be filled using the least number of containers. You may use C to represent a crate.

**1**





$$\begin{array}{r}
 \overline{\phantom{0000}} \\
 3 \overline{) 1, 4, 4, 3}
 \end{array}$$

**2**





$$\begin{array}{r}
 5, \quad 3, \quad 2 \\
 \times \phantom{0000} 9 \\
 \hline
 \overline{\phantom{0000}}
 \end{array}$$

**3**





$$\begin{array}{r}
 1, \quad 1, \quad 2, \quad 5 \\
 \times \phantom{0000} 4 \\
 \hline
 \overline{\phantom{0000}}
 \end{array}$$

**4**





$$\begin{array}{r}
 \overline{\phantom{0000}} \\
 2 \overline{) 3, 9, 6, 8}
 \end{array}$$

**5**

$$\begin{array}{r}
 2, \quad 2, \quad 6, \quad 1 \\
 \times \phantom{0000} 2 \\
 \hline
 \overline{\phantom{0000}}
 \end{array}$$

**6**

$$\begin{array}{r}
 \overline{\phantom{0000}} \\
 4 \overline{) 4, 1, 3, 6}
 \end{array}$$

# Give Me an Estimate

Estimate the product or quotient.

**1**

$$\begin{array}{r} \text{_____} \times \text{X} \times \\ 3 \overline{) 1,177} \end{array}$$

**2**

$$\begin{array}{r} 491 \\ \times \quad \quad \quad 7 \\ \hline \text{_____,_____} \times \times \end{array}$$

**3**

$$\begin{array}{r} 2,280 \\ \times \quad \quad \quad 2 \\ \hline \text{_____,_____} \times \times \times \end{array}$$

**4**

$$\begin{array}{r} \text{_____,_____} \times \times \\ 2 \overline{) 6,432} \end{array}$$

**5**

$$\begin{array}{r} 896 \\ \times \quad \quad \quad 5 \\ \hline \text{_____,_____} \times \times \end{array}$$

**6**

$$\begin{array}{r} \text{_____,_____} \times \times \times \\ 4 \overline{) 8,271} \end{array}$$

**7**

$$\begin{array}{r} 608 \\ \times \quad \quad \quad 2 \\ \hline \text{_____,_____} \times \times \end{array}$$

**8**

$$\begin{array}{r} \text{_____,_____} \times \times \\ 5 \overline{) 1,113} \end{array}$$

**9**

$$\begin{array}{r} 912 \\ \times \quad \quad \quad 6 \\ \hline \text{_____,_____} \times \times \end{array}$$

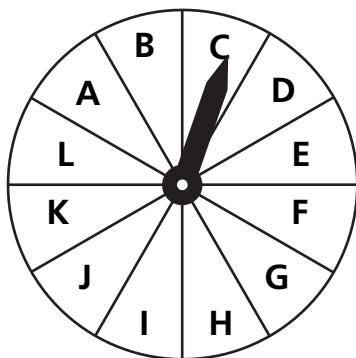
**10**

$$\begin{array}{r} \text{_____,_____} \times \times \\ 6 \overline{) 7,821} \end{array}$$

# Introducing Angles

For 1–2, tell how many players could use the spinner in a fair game, if each letter or color gives one player a point. Explain how each number of players could use the spinner.

1



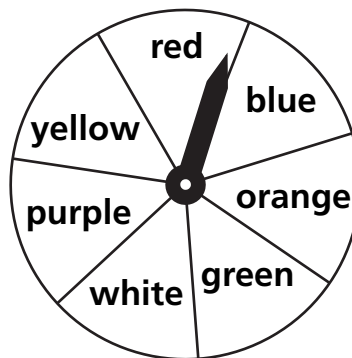
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2



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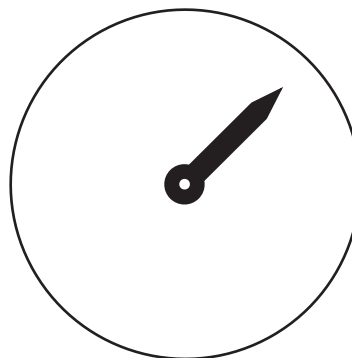
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For 3–4, complete the spinner so that it could be used in a fair game by the number of players named.

3 5 players, but not 2 players



4 3 players, but not 2 players



# Classifying Angles

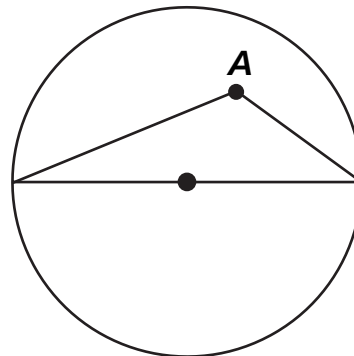
- 1 Mark a point inside of the circle.

Connect your point to both ends of the line going through the center of the circle.

Mark another point inside the circle, and connect it to the ends of the line.

What kind of angles (acute, right, or obtuse) have you made?

\_\_\_\_\_



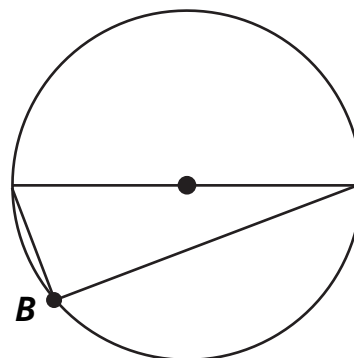
- 2 Mark a point on the edge of the circle.

Connect your point to both ends of the line going through the center of the circle.

Repeat with other points.

What do you notice about all of the angles you made?

\_\_\_\_\_



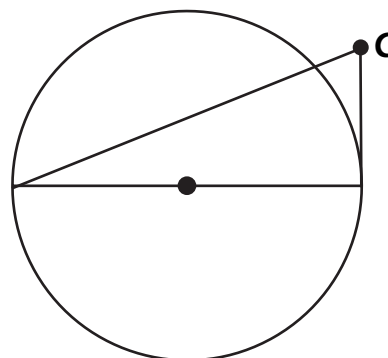
- 3 Mark a point outside of the circle.

Connect your point to both ends of the line going through the center of the circle.

Repeat with other points.

What do you notice about all of the angles you made?

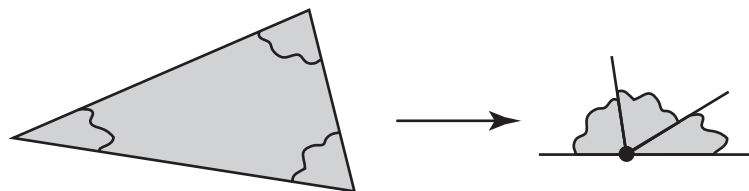
\_\_\_\_\_



# Classifying Triangles by Angles

**You can discover a pattern about the angles of a triangle. Study the model shown below. Then describe what you see.**

The angles of the acute triangle at the right were each torn off. Then the angles were arranged around a point.



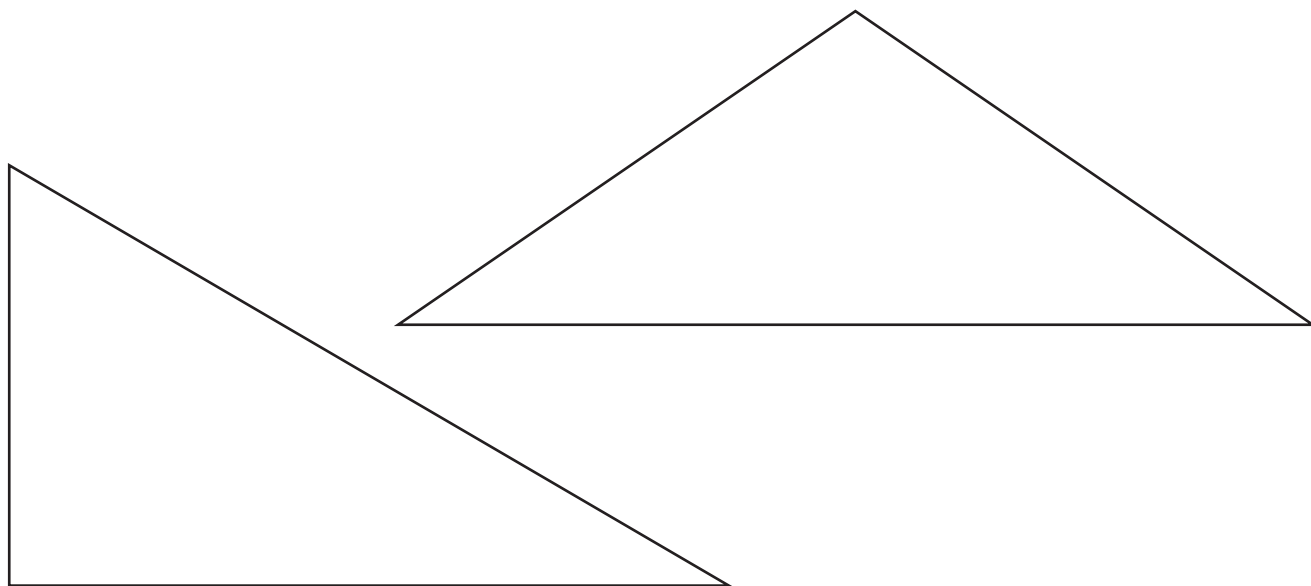
Describe what you see.

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**Now, copy and cut out each of the triangles shown below. Tear off the angles of each triangle, and arrange them around a point on a sheet of paper. Then describe the pattern that you see.**



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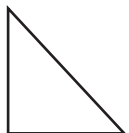
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# Classifying Triangles by Side Length

Use a ruler and a square corner. One of the triangles in each group is different from the rest. Choose the one that is different. Explain your reason for choosing it. In each group, there is more than one possible answer.

1 a.



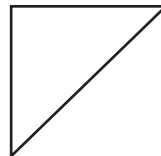
b.



c.



d.



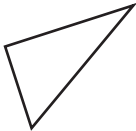
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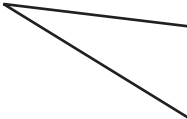
2 a.



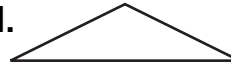
b.



c.



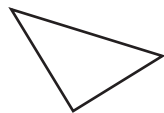
d.



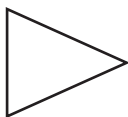
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3 a.



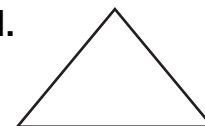
b.



c.



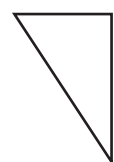
d.



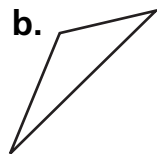
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4 a.



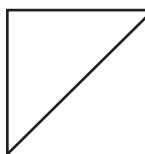
b.



c.



d.

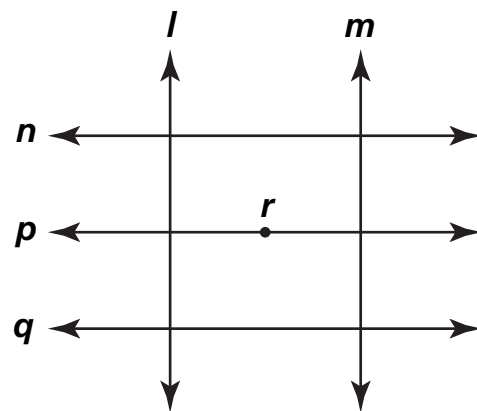


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# Introducing Perpendicular and Parallel Lines

For 1–5, use the figure. Write *true* or *false*, and explain how you decided. You may want to try additional examples on your own.



- 1 If two lines are each parallel to a third line, then they are parallel to each other.

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- 2 If two lines are perpendicular to a third line, then they are perpendicular to each other.

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- 3 If two lines are perpendicular to a third line, then they are parallel to each other.

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- 4 If two lines are parallel to a third line, then they are perpendicular to each other.

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# Classifying Quadrilaterals by the Number of Parallel Sides

Create new figures. Describe what is special about the cuts you make that allow the correct results.

- 1 Cut this parallelogram into two other parallelograms.



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- 2 Cut the parallelogram into two trapezoids.

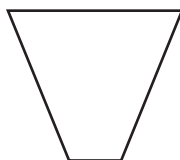


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- 3 Cut this trapezoid into a parallelogram and a triangle.



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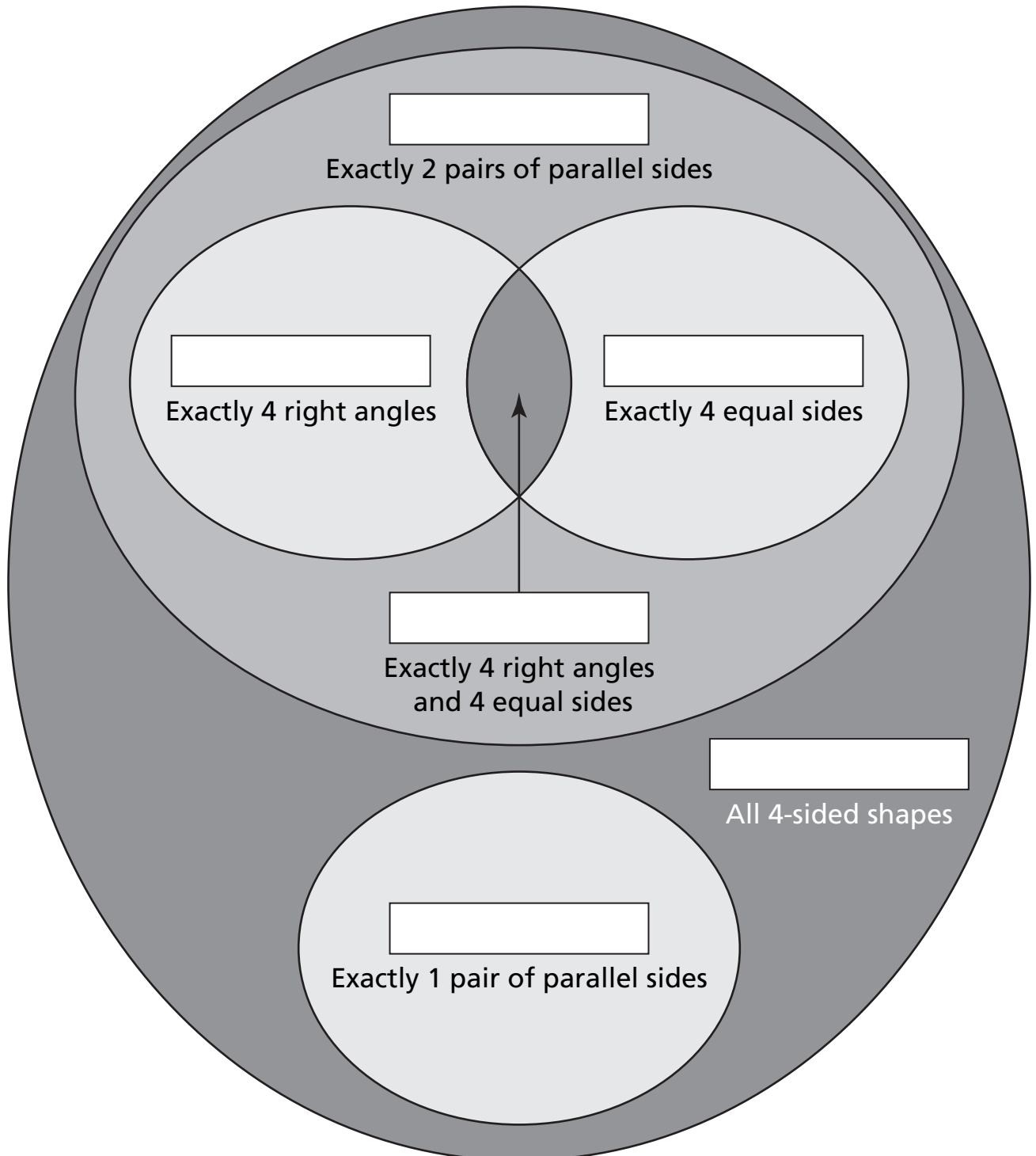
# Classifying Parallelograms

Use the words below to complete the Venn diagram.

parallelograms  
quadrilaterals

rectangles  
rhombuses

squares  
trapezoids



# Symmetry in Triangles and Quadrilaterals

Reflect each figure across the dotted line. You might use a ruler.

- ① What kind of triangle is formed by the figure and its image?

acute and

Are there other lines of symmetry?



- ② Which other angle (or angles) has the same measure as  $\angle A$ ? How do you know?

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- ③ What kind of triangle is formed by the figure and its image?

Draw in all other lines of symmetry.



- ④ Which other angle (or angles) has the same measure as  $\angle A$ ? How do you know?

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# Working with Transformations

Johnny transformed a triangle to make this quadrilateral.

- 1 Describe a transformation Johnny might have done.

\_\_\_\_\_

- 2 Which side is the same length as  $a$ ?

\_\_\_\_\_

- 3 Which side is the same length as  $e$ ?

\_\_\_\_\_

How do you know?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

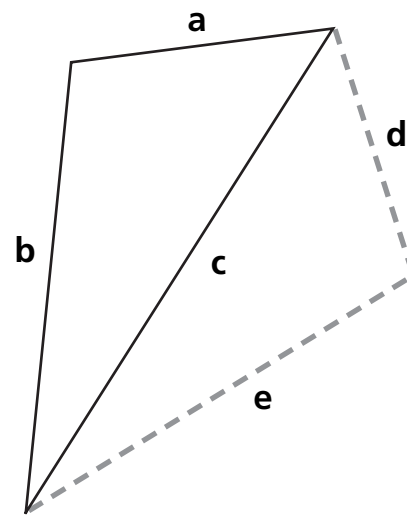
- 4 Are the two triangles congruent?

\_\_\_\_\_

- 5 Triangle  $abc$  could have been transformed to make a parallelogram. Describe this transformation.

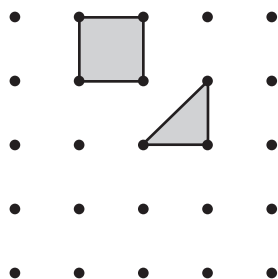
\_\_\_\_\_

\_\_\_\_\_

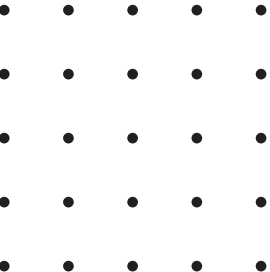
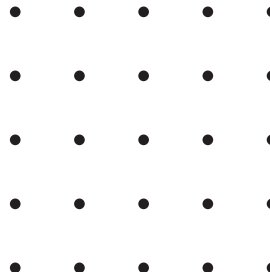
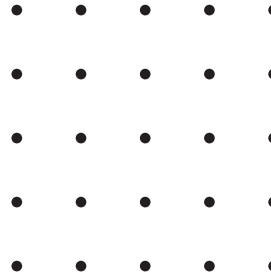
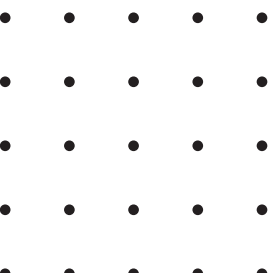
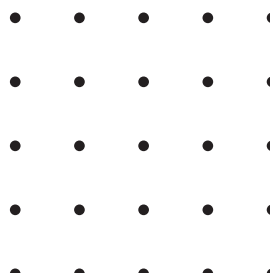
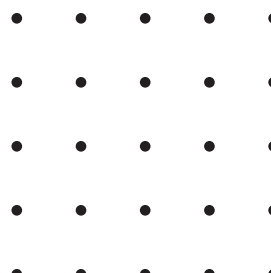
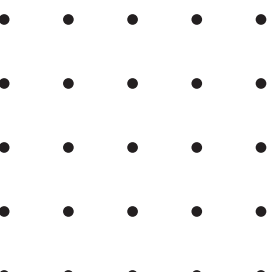
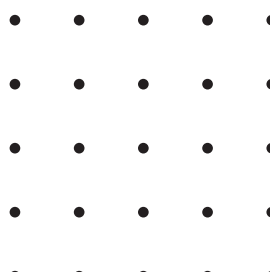
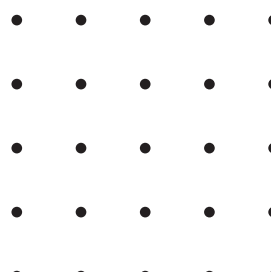


# Introducing Area

The square on the geoboard below has an area of 1 square unit. The triangle has an area of  $\frac{1}{2}$  square unit.

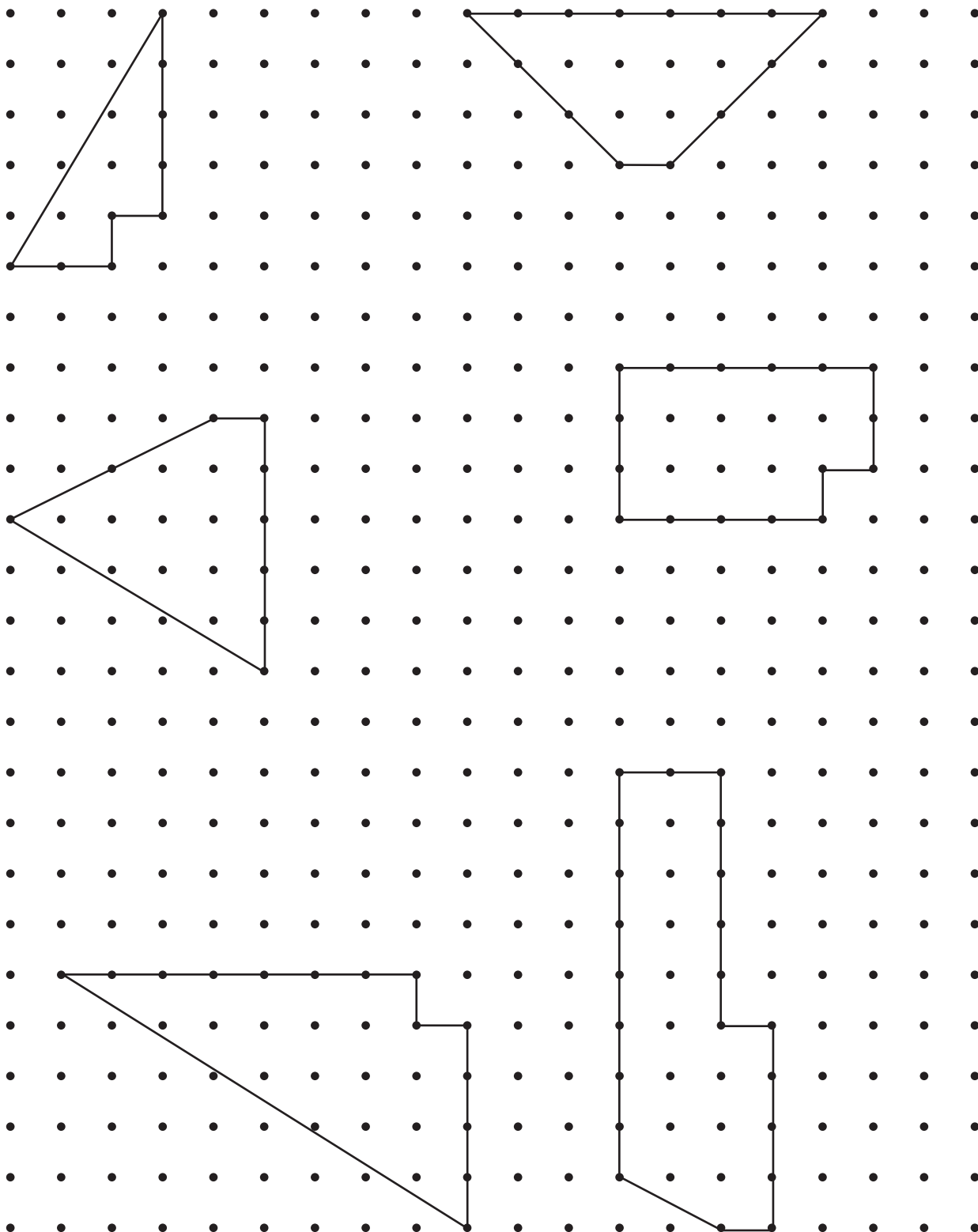


Draw squares or triangles that have the given areas.

<b>1</b>  2 square units	<b>2</b>  3 square units	<b>3</b>  4 square units
<b>4</b>  5 square units	<b>5</b>  6 square units	<b>6</b>  7 square units
<b>7</b>  8 square units	<b>8</b>  9 square units	<b>9</b>  12 square units

# Assembling Congruent Figures to Find Area

Draw a reflection to make congruent figures.

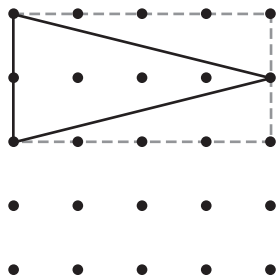




# Using Known Areas to Find Unknown Areas

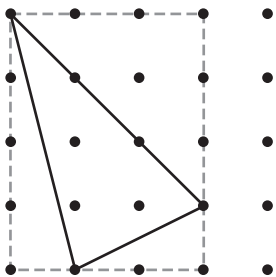
Find the area of each figure. Use the dashed lines to help you. The smallest square on the grid has an area of 1 square unit.

1



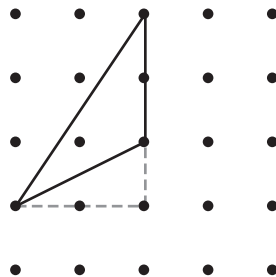
\_\_\_\_\_ square units

2



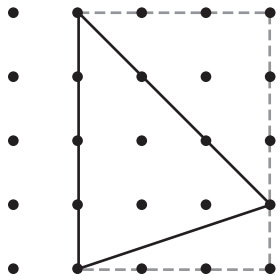
\_\_\_\_\_ square units

3



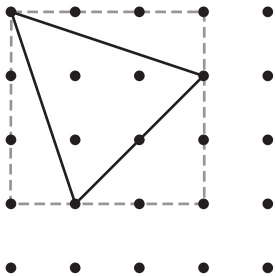
\_\_\_\_\_ square units

4



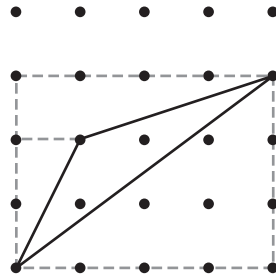
\_\_\_\_\_ square units

5



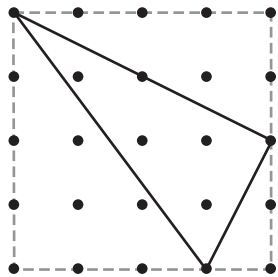
\_\_\_\_\_ square units

6



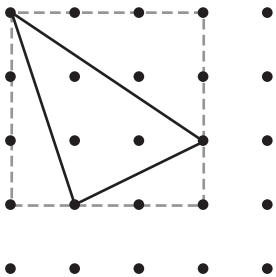
\_\_\_\_\_ square units

7



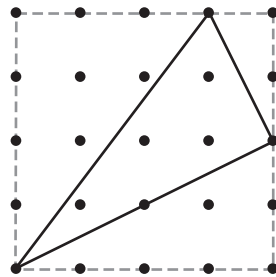
\_\_\_\_\_ square units

8



\_\_\_\_\_ square units

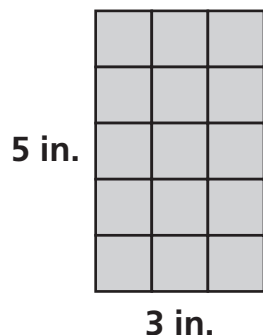
9



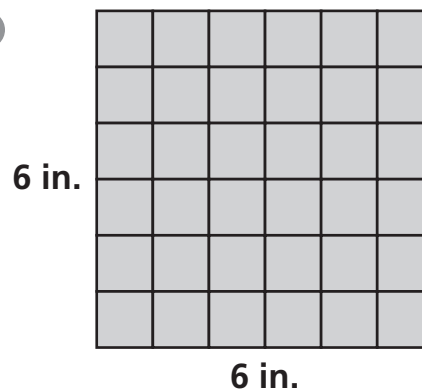
\_\_\_\_\_ square units

# Introducing Standard Units for Measuring Area

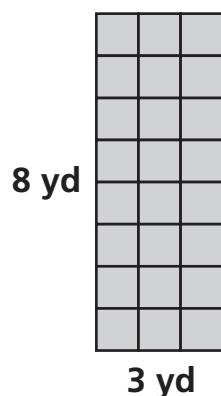
Find each area in the units named.

**1**


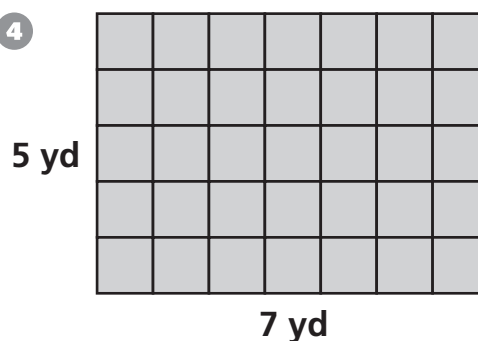
Area = \_\_\_\_\_ square inches

**2**


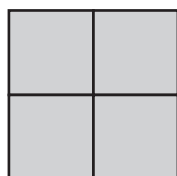
Area = \_\_\_\_\_ square inches

**3**


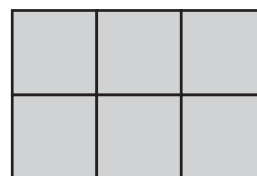
Area = \_\_\_\_\_ square feet

**4**


Area = \_\_\_\_\_ square feet

**5** Each square is 1 ft by 1 ft.


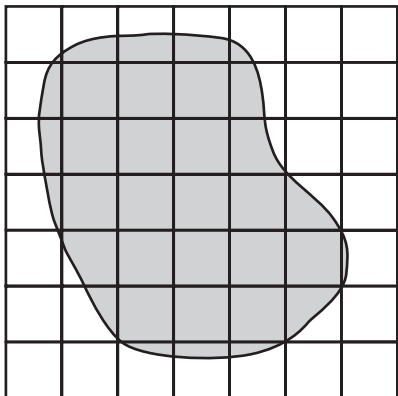
Area = \_\_\_\_\_ square inches

**6** Each square is 12 ft by 12 ft.


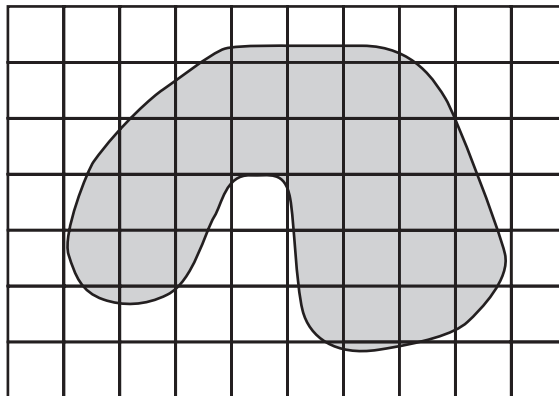
Area = \_\_\_\_\_ square feet

# Estimating Area in Standard Units

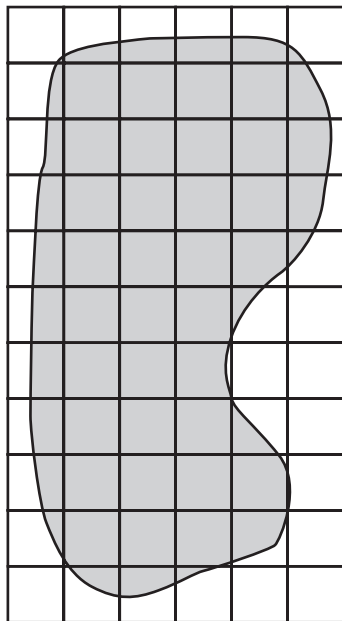
Estimate the area of each figure.

**1**

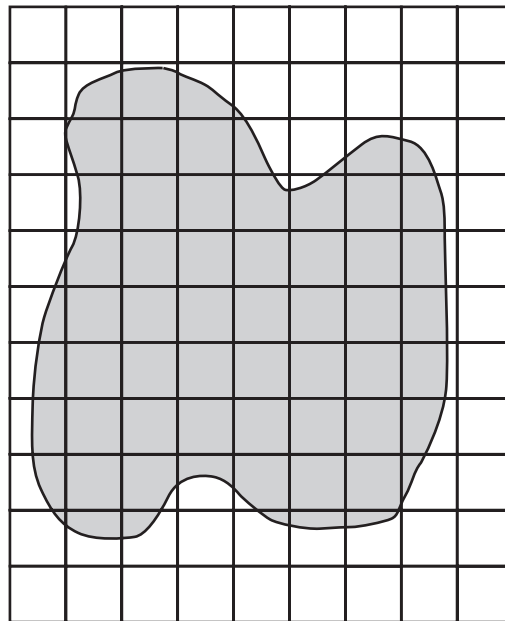
Area is about \_\_\_\_\_ square units.

**2**

Area is about \_\_\_\_\_ square units.

**3**

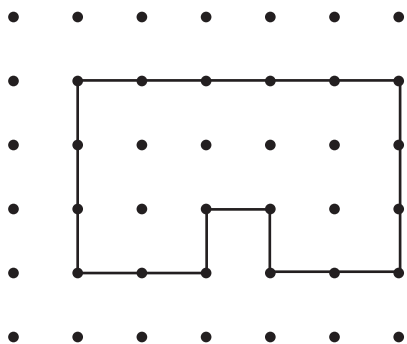
Area is about \_\_\_\_\_ square units.

**4**

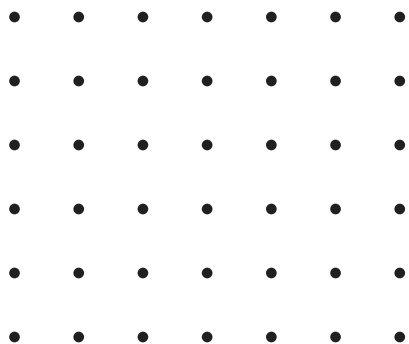
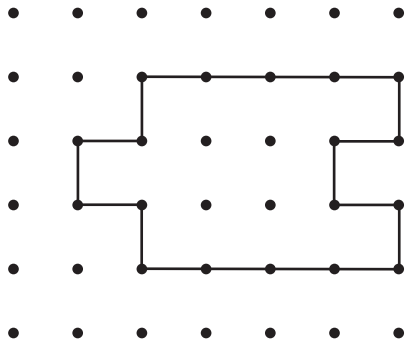
Area is about \_\_\_\_\_ square units.

# Introducing Perimeter

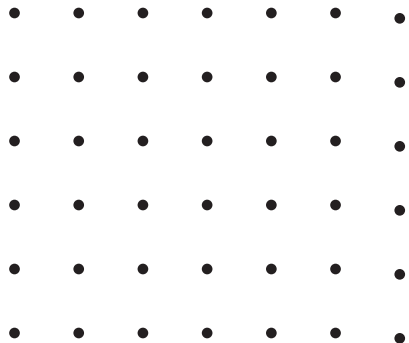
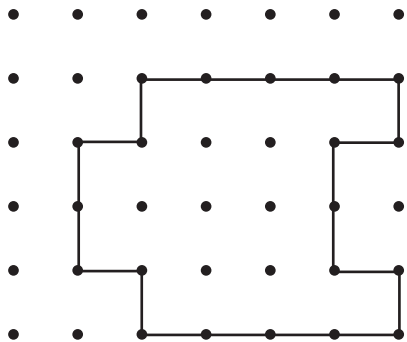
**For each figure, draw another figure that meets the given condition.**

**1**


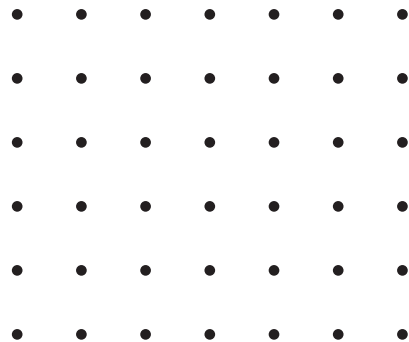
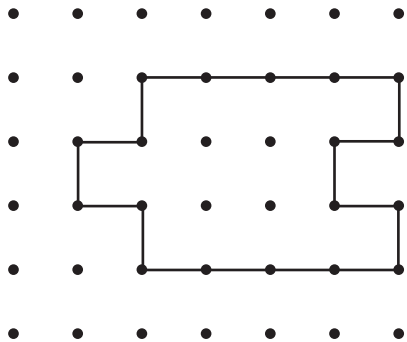
Draw a figure that has a larger area but a smaller perimeter.


**2**


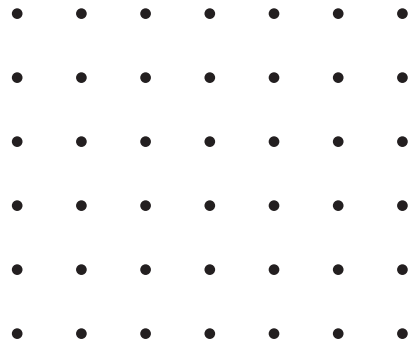
Draw a figure that has the same perimeter but a smaller area.


**3**


Draw a figure that has the same perimeter but a larger area.

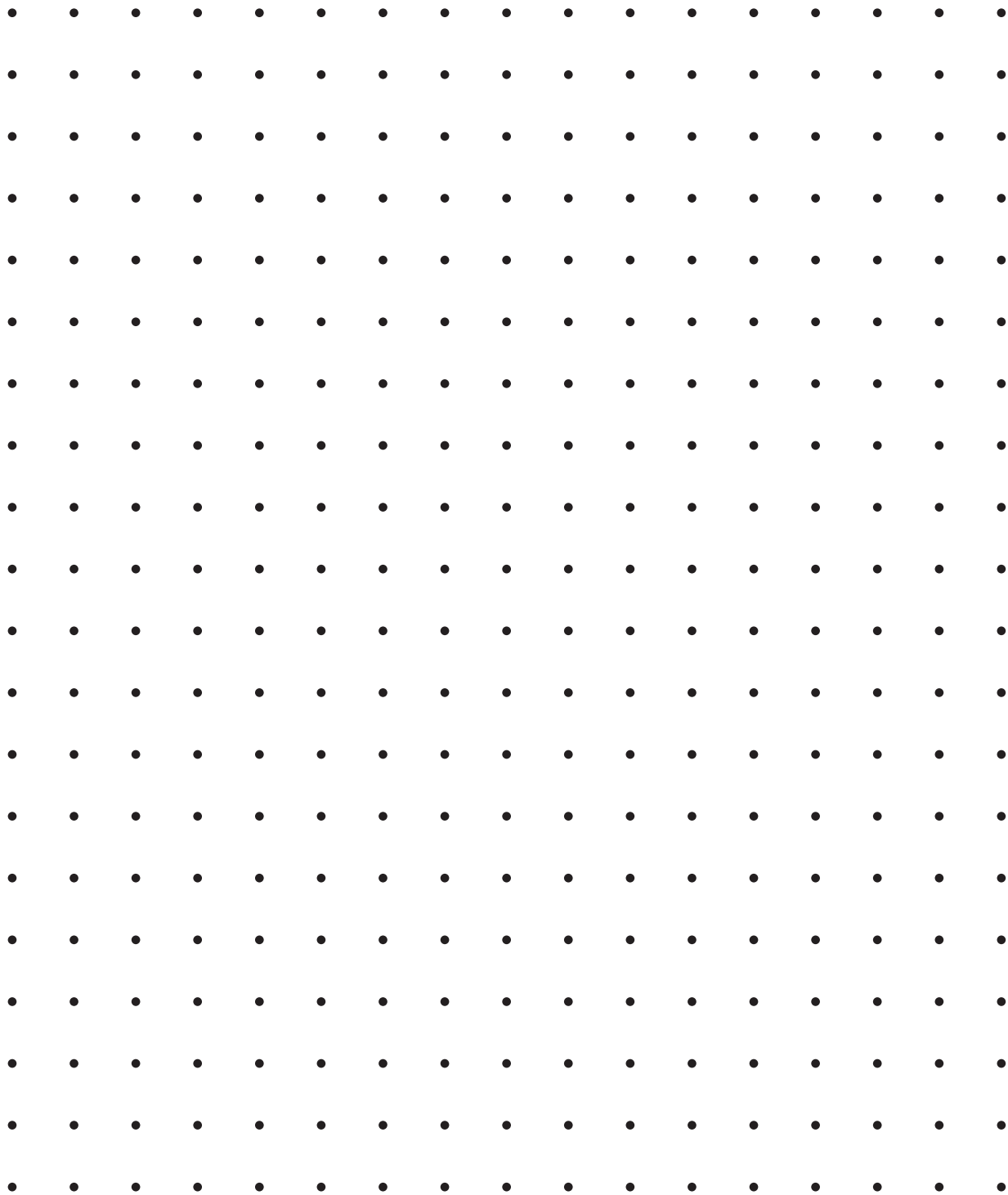

**4**


Draw a figure that has the same area but a larger perimeter.



# Connecting Perimeter and Area

Draw as many rectangles as you can on the grid whose perimeter is **24 centimeters**. The length of each side should be a whole number of centimeters. Each unit in the grid measures 1 square centimeter. Write the area inside each rectangle.



# Multiplication Puzzles

Complete each puzzle.

1

×	
2	3

2

×	
1	7

3

×	
2	9

4

	×	5
1	0	0

5

	×	4
1	0	0

6

5		
	×	8
4	1	

7

	×	
1	2	1

8

	×	
1	4	4

9

2		
	×	0
4	0	0

- 10 On sports day, 18 students were absent. The principal put the 400 remaining students into teams. Each team had 25 students. How many teams were there?

\_\_\_\_\_ teams

# Multiples of 10 and 100

Find each product.

1  $6 \times 30 = \underline{\hspace{2cm}}$

2  $8 \times 40 = \underline{\hspace{2cm}}$

3  $9 \times 80 = \underline{\hspace{2cm}}$

4  $60 \times 3 = \underline{\hspace{2cm}}$

5  $80 \times 40 = \underline{\hspace{2cm}}$

6  $9 \times 800 = \underline{\hspace{2cm}}$

Complete each puzzle.

7

	$\times$	7
	9	0

8

	$\times$	4
1	6	0

9

		0
	$\times$	6
	6	

10

	$\times$	8
8	0	0

11

2	0	
	$\times$	
6		0

12

	0	
	$\times$	3
9		0

13

		7	0
		$\times$	2
		2	0

14

		5	
		$\times$	5
	5	0	0

15

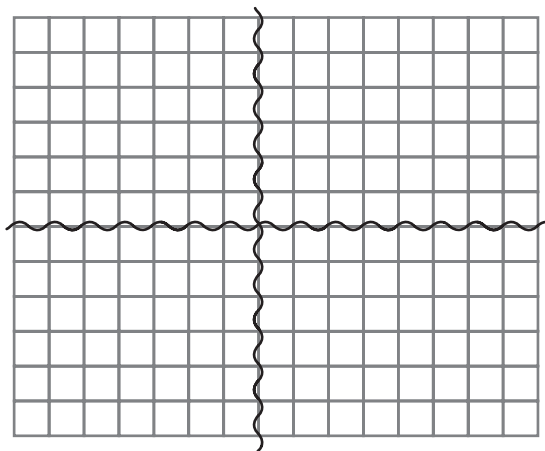
		$\times$	5
3	5	0	0

# Using Arrays to Model Multiplication

Complete each chart to find the number of squares in each array.

**1**

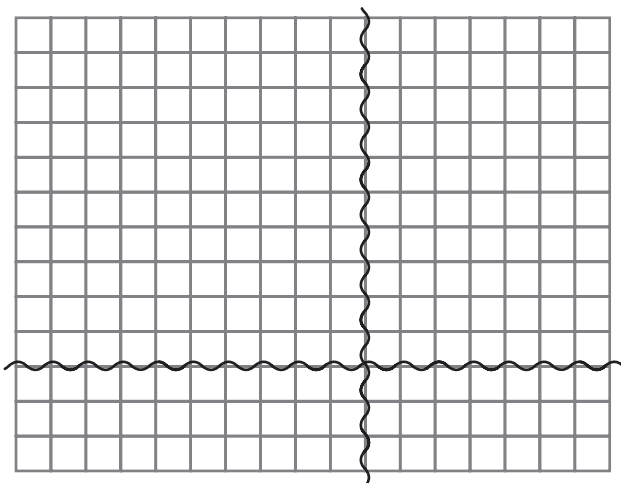
$$15 \times 12$$



×	7	8	
6	42		
6			
12			

**2**

$$17 \times 13$$



×	10	7	
10			
3			

- 3** There are two classes of 24 students and two classes of 20 students. How many buses will be needed to transport them if each bus has 11 rows with 4 seats in each row? Explain.

---



---





# Work Backward

**Work backward to split the factors. Use the largest multiples of 10 that you can. Then find the product.**

**1**

×			61
26			

**2**

×			18
34			

**3**

×			77
52			

**4**

×			48
49			

**5**

×			12
93			

**6**

×			32
89			

**7**

×			72
62			

**8**

×			88
56			

# From Charts to Vertical Records

Find the missing digits in the problems below.

1

		1	7
	×	6	0

2

		2	3
	×		0
		9	0

3

		3	
	×	4	0
		2	0
		0	0

4

		5	
	×	1	4
2		0	0

5

			8
	×	7	0
2	8	0	0

6

		6	1
	×		
		2	0
1	2	0	0

7

			8
	×	9	
		7	2
6	3	0	0

8

		5	
	×	8	
		2	4
		0	0

9

	×	3	
		2	7
		9	0
		0	0

# Recording Your Process of Multiplication

**Multiply.**

1

1	5	2
×	1	6

2

2	1	7
×	3	4

3

3	0	5
×	2	8
		0
		0

4

		1	9
×	1	7	4

5

			2	8
×		4	1	0
				0
				0

6

		6	8	1
×		3	7	

# Checking for Reasonable Answers

Find the products. For help, use the problems on either side of the center problem.

1

$$\begin{array}{r} 100 \\ \times 10 \\ \hline \end{array}$$

$$\begin{array}{r} 70 \\ \times 10 \\ \hline \end{array}$$

1	7	3
$\times$	1	2

$$\begin{array}{r} 100 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ \times 10 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 70 \\ \times 2 \\ \hline \end{array}$$

2

		5	3
$\times$	2	2	9

3

9	4	0
$\times$	4	1

# Multiplication Situations

**1**

$27 \times 16 = \boxed{\phantom{000}}$

	×	20	7	27	
6		120	42	162	$27 \times 6 \rightarrow$ $27 \times 10 \rightarrow$ $27 \times 16 \rightarrow$
10					
16					

	×	2	7
		1	6

**2**

$38 \times 43 = \boxed{\phantom{000}}$

		30	8	38	
40					$38 \times 40 \rightarrow$ $38 \times 3 \rightarrow$ $38 \times 43 \rightarrow$
3					
43					

	×	3	8
		4	3

**3**

	9	
	×	5
4	9	5

**4**

	×	8
6	4	0

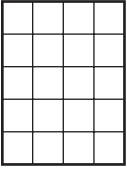
**5**

1	1	8
	×	
	9	0

**6**

	×	9
	8	7

# Exploring Fractions

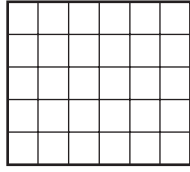
1  Perimeter:  units  
Area:  sq units

$\frac{1}{5}$  of the area is \_\_\_\_\_ square units

$\frac{2}{5}$  of the area is \_\_\_\_\_ square units

$\frac{3}{5}$  of the area is \_\_\_\_\_ square units

$\frac{4}{5}$  of the area is \_\_\_\_\_ square units

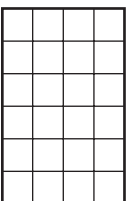
2  Perimeter:  units  
Area:  sq units

$\frac{1}{5}$  of the area is \_\_\_\_\_ square units

$\frac{2}{5}$  of the area is \_\_\_\_\_ square units

$\frac{3}{5}$  of the area is \_\_\_\_\_ square units

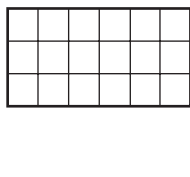
$\frac{6}{5}$  of the area is \_\_\_\_\_ square units

3  Perimeter:  units  
Area:  sq units

$\frac{1}{8}$  of the area is \_\_\_\_\_ square units

$\frac{3}{8}$  of the area is \_\_\_\_\_ square units

$\frac{6}{8}$  of the area is \_\_\_\_\_ square units

4  Perimeter:  units  
Area:  sq units

$\frac{1}{6}$  of the area is \_\_\_\_\_ square units

$\frac{3}{6}$  of the area is \_\_\_\_\_ square units

$\frac{5}{6}$  of the area is \_\_\_\_\_ square units

- 5 Separate the group of stars into thirds.



\_\_\_\_\_ stars are in  $\frac{1}{3}$  of the group.

\_\_\_\_\_ stars are in  $\frac{2}{3}$  of the group.

\_\_\_\_\_ stars are in  $\frac{3}{3}$  of the group.

\_\_\_\_\_ stars are in  $\frac{4}{3}$  of the group.

- 6 Divide the segment into fourths.







If the line segment were 4 inches long, how long would  $\frac{1}{4}$  of it be? \_\_\_\_\_



If the line segment were 16 inches long, how long would  $\frac{1}{4}$  of it be? \_\_\_\_\_



# Exploring Fractions Greater than 1



Try these problems. You can use pattern blocks if they help.



1 If  is 5, then what is  ? \_\_\_\_\_



2 If  is 32, then what is  ? \_\_\_\_\_



3 If  is 5, then what is  ? \_\_\_\_\_



4 If  is 6, then what is  ? \_\_\_\_\_



5 If  is  $4\frac{1}{2}$ , then what is  ? \_\_\_\_\_

6 If  is 5, then what is  ? \_\_\_\_\_

7 If  is 1, then what is  ? \_\_\_\_\_

8 If  is 2, then what is  ? \_\_\_\_\_

9 If  is 3, then what is  ? \_\_\_\_\_

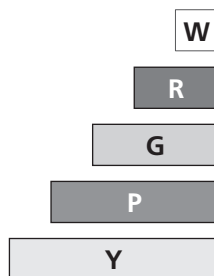
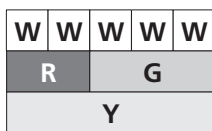
10 If  is  $1\frac{1}{2}$ , then what is  ? \_\_\_\_\_



# Exploring Fractions with Cuisenaire® Rods

To complete the number sentences, refer to these Cuisenaire® Rods.

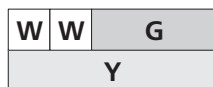
The yellow rod equals 1.

**1**

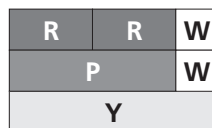
$$\frac{2}{5} + \frac{3}{5} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$$

**2**

$$\frac{2}{5} + \frac{2}{5} + \frac{1}{5} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$$

**3**

$$\frac{3}{5} + \frac{1}{5} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$$

**4**

$$\frac{4}{5} + \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}} = \frac{5}{5}$$

**5**

$$\frac{4}{5} + \frac{2}{5} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$$

**6**

$$\frac{3}{5} + \frac{4}{5} = \frac{\boxed{\phantom{00}}}{\boxed{\phantom{00}}}$$

# Reasoning about Cuisenaire® Rod Fractions

Nick's recipe for trail mix calls for:

- 1 c granola
- $\frac{1}{2}$  c dried apricots
- $\frac{2}{3}$  c sunflower seeds
- $\frac{3}{4}$  c raisins
- $\frac{1}{4}$  c chocolate chips

Nick decided to make one batch of trail mix. He looked to see if he had what he needed. This is what he found in his kitchen:

- $\frac{9}{8}$  c granola
- $\frac{4}{8}$  c dried apricots
- $\frac{1}{3}$  c sunflower seeds
- $\frac{3}{8}$  c raisins
- $\frac{1}{3}$  c chocolate chips

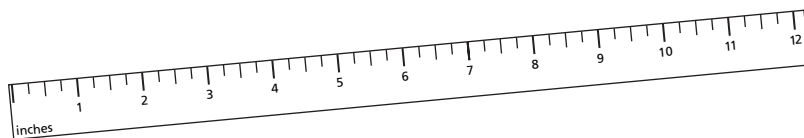
- 1 Which ingredients does he NOT have enough of? \_\_\_\_\_
- 2 With the ingredients that Nick already has, how much trail mix can he make? \_\_\_\_\_
- 3 How much of each ingredient will Nick use? \_\_\_\_\_

- 4 How much granola will Nick have left? \_\_\_\_\_

- 5 Which other ingredients will Nick NOT use up completely? \_\_\_\_\_

# Fractions of a Foot

Use an inch ruler to solve.



12 inches = 1 foot

1 yard = 3 feet

1  $\frac{1}{2}$  foot = \_\_\_\_\_ inches

2  $\frac{1}{4}$  foot = \_\_\_\_\_ inches

3  $\frac{1}{3}$  foot = \_\_\_\_\_ inches

4 \_\_\_\_\_ foot = 1 inch

5 \_\_\_\_\_ foot = 5 inches

6 \_\_\_\_\_ foot = 2 inches

7 1 yard = \_\_\_\_\_ inches

8  $\frac{1}{2}$  yard = \_\_\_\_\_ inches

9  $\frac{1}{3}$  yard = \_\_\_\_\_ inches

10 \_\_\_\_\_ yard = 1 inch

11 \_\_\_\_\_ yard = 5 inches

12 \_\_\_\_\_ yard = 24 inches

13  $\frac{1}{3}$  yard +  $\frac{1}{6}$  yard = \_\_\_\_\_ inches

14  $\frac{1}{3}$  yard +  $\frac{1}{2}$  yard +  $\frac{1}{6}$  yard = \_\_\_\_\_ inches

# Comparing Fractions with One Half

Complete each fraction so that it equals  $\frac{3}{4}$ .

$\frac{3}{4}$	$\frac{12}{\quad}$	$\frac{60}{\quad}$	$\frac{54}{\quad}$
	$\frac{40}{\quad}$		
	$\frac{8}{\quad}$	$\frac{160}{\quad}$	

Use  $<$ ,  $>$ , or  $=$  to compare the fractions.

1  $\frac{1}{2} \bigcirc \frac{3}{4}$

2  $\frac{2}{2} \bigcirc \frac{3}{4}$

3  $\frac{3}{2} \bigcirc \frac{3}{4}$

4  $\frac{7}{8} \bigcirc \frac{3}{4}$

5  $\frac{1}{8} \bigcirc \frac{3}{4}$

6  $\frac{6}{8} \bigcirc \frac{3}{4}$

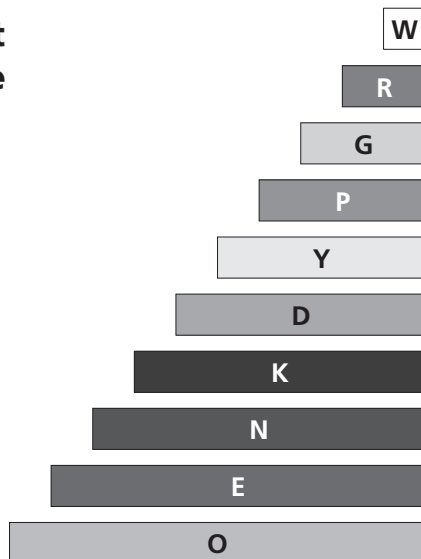
7  $\frac{7}{15} \bigcirc \frac{3}{4}$

8  $\frac{14}{15} \bigcirc \frac{3}{4}$

9  $\frac{8}{15} \bigcirc \frac{3}{4}$

# Comparing Fractions

Draw two Cuisenaire® Rods to represent the fractions. In all of the problems, the orange rod is equal to 1. You can use Cuisenaire® Rods if you need help.



1  $\frac{1}{5}$



2  $\frac{2}{4}$

3  $\frac{9}{10}$

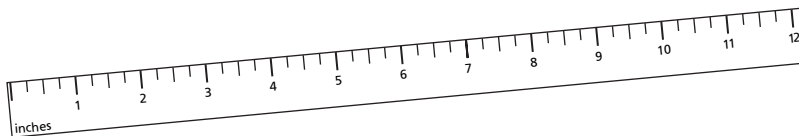
4  $\frac{4}{5}$

5  $\frac{12}{20}$

6  $\frac{20}{50}$

# Finding Equivalent Fractions

Use an inch ruler to solve.



1  $\frac{1}{6}$  of a foot is \_\_\_\_\_ inches.  $\frac{2}{12}$  of a foot is also 2 inches.

---

2  $\frac{2}{6}$  of a foot is \_\_\_\_\_ inches. \_\_\_\_\_ of a foot is also \_\_\_\_\_ inches.

---

3  $\frac{3}{6}$  of a foot is \_\_\_\_\_ inches. \_\_\_\_\_ of a foot is also \_\_\_\_\_ inches.

---

4  $\frac{6}{6}$  of a foot is \_\_\_\_\_ inches. \_\_\_\_\_ of a foot is also \_\_\_\_\_ inches.

---

5  $\frac{7}{6}$  of a foot is \_\_\_\_\_ inches. \_\_\_\_\_ of a foot is also \_\_\_\_\_ inches.

# Making Equivalent Fractions

Complete the sentences.

1  $\frac{9}{18} = \frac{1}{\square}$

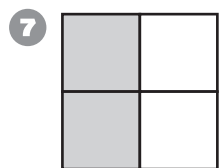
2  $\frac{9}{27} = \frac{1}{\square}$

3  $\frac{6}{8} = \frac{3}{\square}$

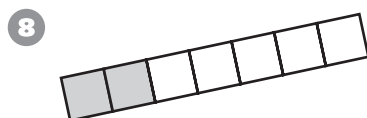
4  $\frac{15}{75} = \frac{5}{\square}$

5  $\frac{3}{21} = \frac{1}{\square}$

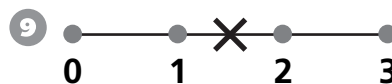
6  $\frac{18}{30} = \frac{3}{\square}$



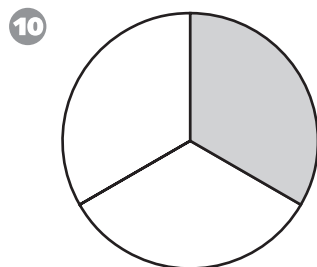
Half of  $\frac{1}{2}$  is \_\_\_\_\_.



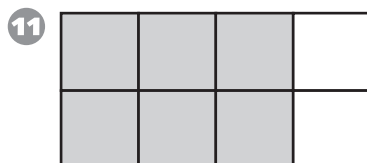
Half of  $\frac{2}{7}$  is \_\_\_\_\_.



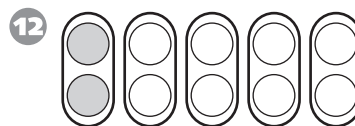
Half of 3 is \_\_\_\_\_.



Half of  $\frac{1}{3}$  is \_\_\_\_\_.



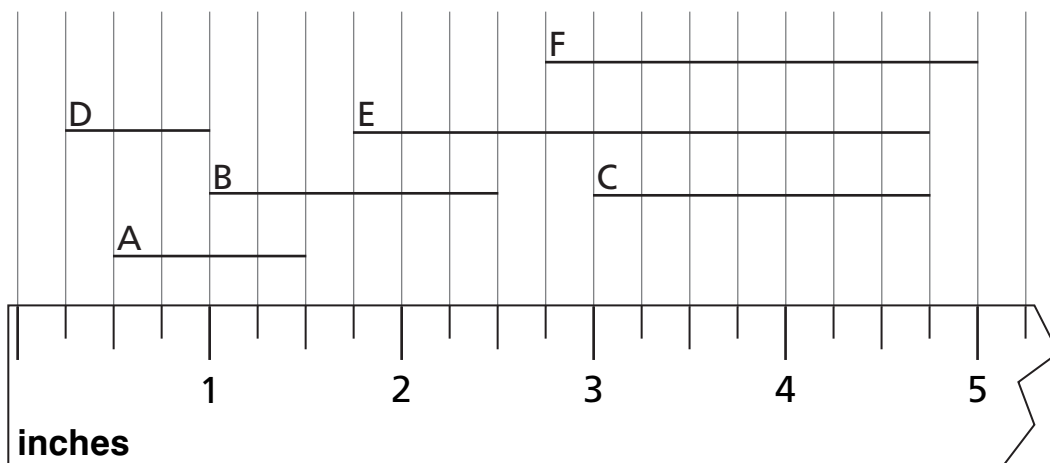
Half of  $\frac{3}{4}$  is \_\_\_\_\_.



Half of  $\frac{1}{5}$  is \_\_\_\_\_.

# Fractions in Measurement

Record the lengths of these lines.



**Lengths:**

A: \_\_\_\_\_ inches      C: \_\_\_\_\_ inches      E: \_\_\_\_\_ inches

B: \_\_\_\_\_ inches      D: \_\_\_\_\_ inches      F: \_\_\_\_\_ inches

**Sums of lengths:**

A and B: \_\_\_\_\_ inches

D and E: \_\_\_\_\_ inches

B and C: \_\_\_\_\_ inches

E and F: \_\_\_\_\_ inches

**Differences between lengths:**

B and D: \_\_\_\_\_ inches

E and F: \_\_\_\_\_ inches

B and A: \_\_\_\_\_ inches

C and D: \_\_\_\_\_ inches



# Modeling Addition of Fractions

Make  $\frac{2}{3}$  in as many ways as you can. Record your number sentences below. Use the back of the page if you have ideas for more number sentences.

$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$
---------------	---------------	---------------

1  $\frac{\square}{\square} + \frac{\square}{\square} = \frac{2}{3}$

2  $\frac{\square}{\square} - \frac{\square}{\square} = \frac{2}{3}$

3  $\frac{\square}{\square} + \frac{\square}{\square} = \frac{2}{3}$

4  $\frac{\square}{\square} - \frac{\square}{\square} = \frac{2}{3}$

5  $\frac{\square}{\square} = \frac{2}{3}$

6  $\frac{\square}{\square} = \frac{2}{3}$

7  $\frac{\square}{\square} = \frac{2}{3}$

8  $\frac{\square}{\square} + \frac{\square}{\square} + \frac{\square}{\square} = \frac{2}{3}$

9  $\frac{\square}{\square} - \frac{\square}{\square} - \frac{\square}{\square} = \frac{2}{3}$

# Place Value

**Answer these questions about the numbers from 1 to 1,000.**

- 1** If no numbers in the table to the right were omitted, how many numbers would there be?

- 2** How many numbers are less than 1,000?

- 3** How many 3-digit numbers are there?

- 4** How many of the 3-digit numbers are even?

- 5** How many of the 3-digit numbers are odd?

- 6** How many of the 3-digit numbers have a 2 in the hundreds place?

- 7** How many of the 3-digit numbers have a 2 in the tens place?

- 8** How many of the 3-digit numbers have a 2 in the hundreds place and a 2 in the tens place?

- 9** How many numbers are greater than 200 and less than 210?

1	2	3	...	...	...	...	...	...	100
101	102	103	...	...	...	...	...	...	200
201	202	203	...	...	...	...	...	...	300
301	302	303	...	...	...	...	...	...	400
401	402	403	...	...	...	...	...	...	500
501	502	503	...	...	...	...	...	...	600
601	602	603	...	...	...	...	...	...	700
701	702	703	...	...	...	...	...	...	800
801	802	803	...	...	...	...	...	...	900
901	902	903	...	...	...	...	...	...	1,000

- 10** How many numbers are greater than 200 and less than 300?

- 11** How many of the 3-digit numbers are multiples of 100?

- 12** How many of the 3-digit numbers are multiples of 200?

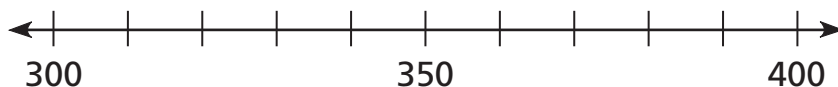
- 13** How many numbers have 2 digits?

# Introducing Decimals

Shade part of each number line to show where the number must be.

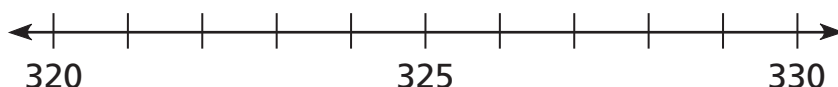
① 

3	2	
---	---	--



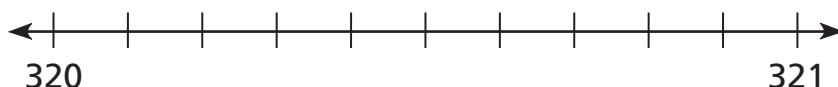
② 

3	2	0	.	
---	---	---	---	--



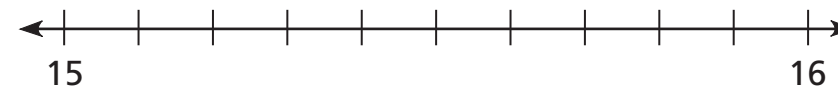
③ 

3	2	0	.	4	
---	---	---	---	---	--



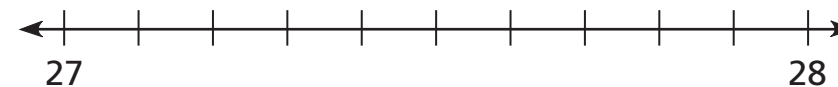
④ 

1	5	.	6	
---	---	---	---	--



⑤ 

2	7	.	1	
---	---	---	---	--



**Continue the pattern.**

⑥ 1, 2, 4, 8, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

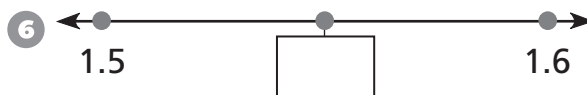
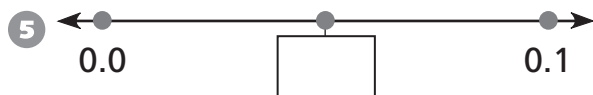
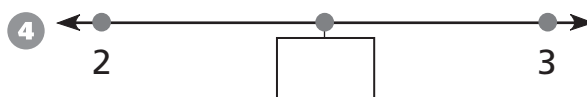
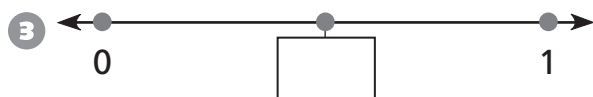
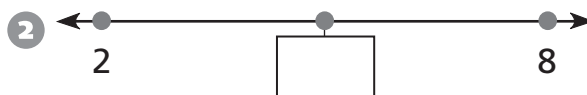
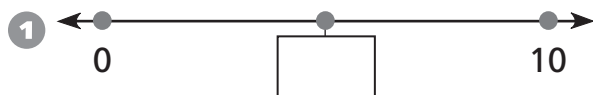
⑦ 8, 4, 2, 1,  $\frac{1}{2}$ , \_\_\_\_\_, \_\_\_\_\_

⑧ 1, 10, 100, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

⑨ 1,000, 100, 10, \_\_\_\_\_, \_\_\_\_\_

# Zooming in on the Number Line

Write the number that is halfway between the two numbers.



7 Circle the smaller number in each pair.

3.7

3.09

4.10

4.03

7.99

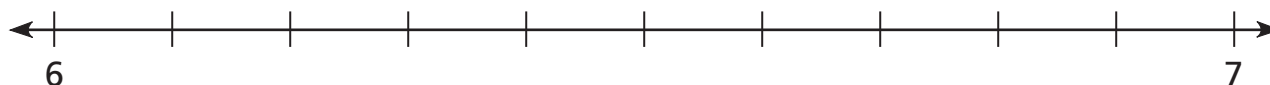
8.00

6.05

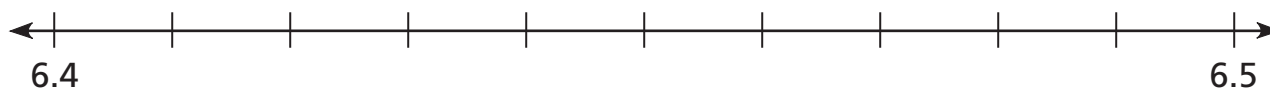
6.3

# Decimals on the Number Line

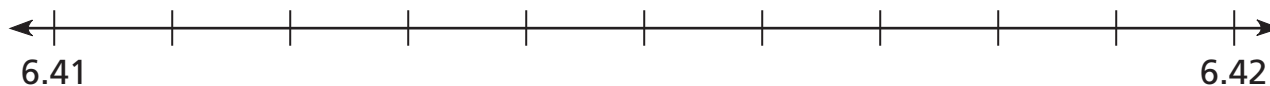
- 1 Shade part of the number line to show all numbers between 6.3 and 6.5.



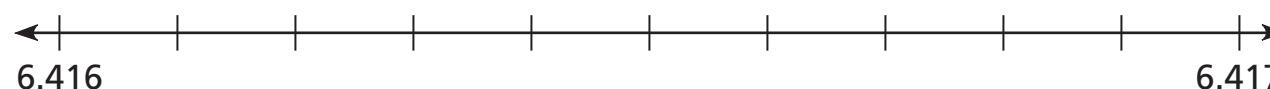
- 2 Shade part of the number line to show all numbers between 6.41 and 6.45.



- 3 Shade part of the number line to show all numbers between 6.416 and 6.419.



- 4 Shade part of the number line to show all numbers between 6.4163 and 6.4165.



- 5 Write 2 numbers that are between 6.416 and 6.419.

6.416

6.419

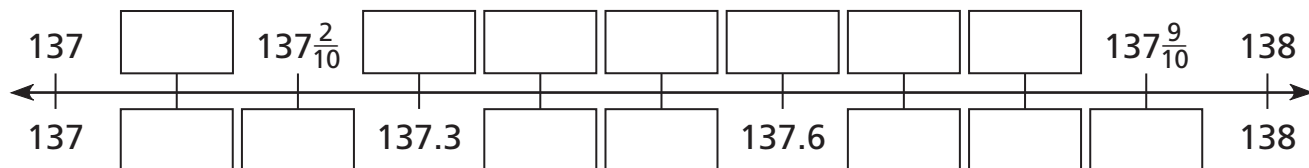
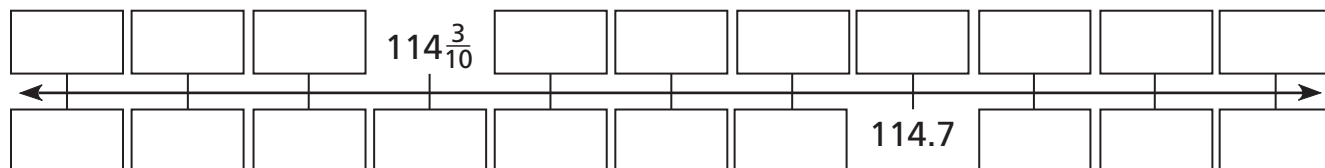
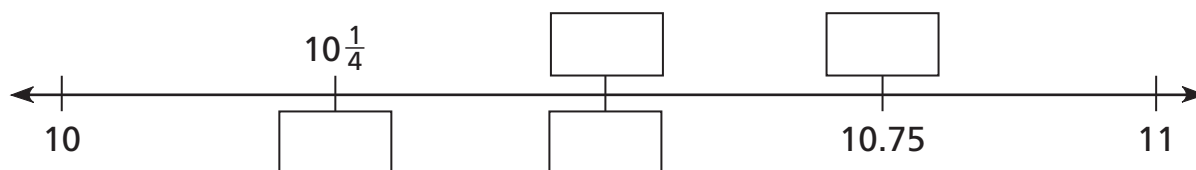
- 6 Write 2 numbers that are between 6.4163 and 6.4164.

6.4163

6.4164

# Connecting Fractions and Decimals

**Label these number lines using fractions and decimals.**

**1****2****3**

**Find the total amount in dollars and cents.**

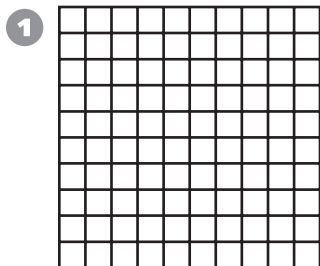
**4**  $\$1.63 + \frac{1}{4}$  of a dollar =

**5**  $\frac{1}{2}$  of a dollar +  $\frac{1}{4}$  of a dollar + \$1.00 =

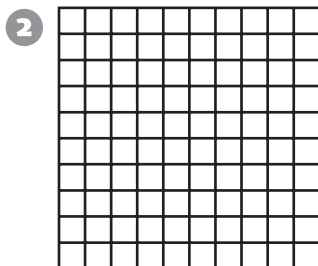
**6**  $\frac{3}{10}$  of a dollar + \$2.19 =

# Representing Decimals Using a Grid

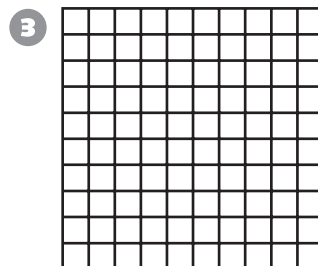
Shade each diagram to match the number below it.



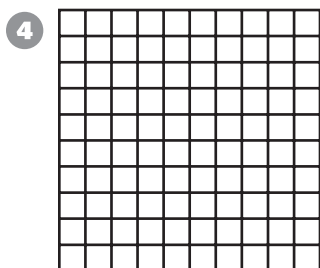
0.2



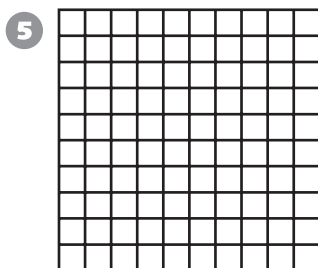
0.650



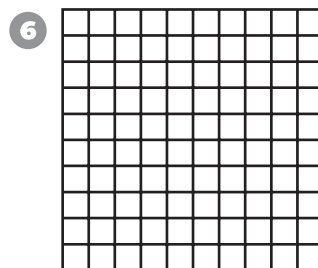
1.000



0.04



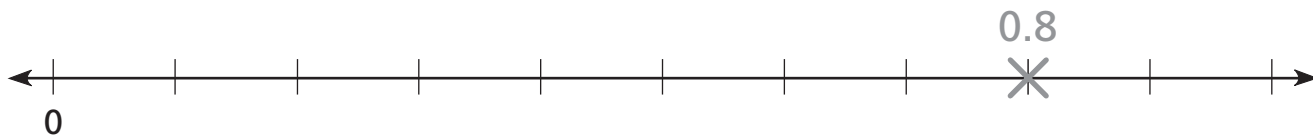
$0.6 + 0.2$



$1 - 0.7$

7 Write these numbers in order on the number line.

0.8    $\frac{1}{5}$    0.5   0.71   0.708    $\frac{6}{10}$    0.08    $\frac{1}{2}$    0.92



# Representing Decimals Using Base-Ten Blocks

You may use base-ten blocks to help you complete this page.

1  $1.36 + 1.43 =$  \_\_\_\_\_

2  $2.73 + 0.68 =$  \_\_\_\_\_

3  $8.65 - 3.27 =$  \_\_\_\_\_

4  $10.60 - 1.82 =$  \_\_\_\_\_

5  $3.09 + 2.16 =$  \_\_\_\_\_

6  $6.08 - 0.1 =$  \_\_\_\_\_

7  $1.13 + 0.82 + 4.06 =$  \_\_\_\_\_

8  $10.80 - 0.79 - 1.65 =$  \_\_\_\_\_

- 9 Liz had \$20.00. She bought a shirt for \$14.95 and some milk for \$3.65. How much money did she have left?

\_\_\_\_\_



# Adding Decimals

Find the missing numbers.

1

$$\begin{array}{r} 0.31 \\ + 0.49 \\ \hline \square \end{array}$$

2

$$\begin{array}{r} 1.06 \\ + 3.99 \\ \hline \square \end{array}$$

3

$$\begin{array}{r} 0.78 \\ + 0.87 \\ \hline \square \end{array}$$

4

$$\begin{array}{r} 1.65 \\ + \square \\ \hline 3.11 \end{array}$$

5

$$\begin{array}{r} 0.92 \\ + \square \\ \hline 0.99 \end{array}$$

6

$$\begin{array}{r} 1.26 \\ + \square \\ \hline 5.08 \end{array}$$

7 Solve the problem.

Mr. Smith went out to lunch. He paid with a \$10 bill and received \$5.63 in change. How much did his lunch cost?

\_\_\_\_\_

# Subtracting Decimals

Use the clues to find the missing numbers.

1

$$\begin{array}{r} 1.65 \\ - \square \\ \hline 0.35 \end{array}$$

2

$$\begin{array}{r} 2.07 \\ - \square \\ \hline 1.95 \end{array}$$

3

$$\begin{array}{r} 1.80 \\ - \square \\ \hline 1.05 \end{array}$$

4

$$\begin{array}{r} \square \\ - 0.09 \\ \hline 0.60 \end{array}$$

5

$$\begin{array}{r} \square \\ - 0.82 \\ \hline 1.65 \end{array}$$

6

$$\begin{array}{r} \square \\ - 1.03 \\ \hline 1.78 \end{array}$$

7 Solve the problem.

Gina and Ellie combined their money to buy a new book. Gina had \$6.02 and Ellie had \$7.25. The book cost \$12.95. How much money did they have left after buying the book? Use blocks and pictures to help you. Explain how you got your answer.

\_\_\_\_\_

# Representing Decimals Using Money

Use this price chart to answer the questions.

T-shirt	\$7.95
Book	\$9.50
Sandwich	\$6.35
Water	\$1.60
Bus Ticket	\$25.40

- 1 Rona bought some of the items in the chart. She spent \$17.45. What might she have bought?

- 2 David had \$4.60 left after paying for his items with \$30. What might he have bought? Find two different possible purchases.

# Computing with Time and Money

Write the measurement units or numbers.

1 3 feet + 5 feet = \_\_\_\_\_ inches

\_\_\_\_\_

2 4 \_\_\_\_\_ + 11 \_\_\_\_\_ = 59 \_\_\_\_\_

\_\_\_\_\_

3 2 \_\_\_\_\_ + 20 minutes = 140 \_\_\_\_\_

\_\_\_\_\_

4 2 \_\_\_\_\_  $\times$  2 = 240 \_\_\_\_\_

\_\_\_\_\_

5 6 \_\_\_\_\_ + 4 \_\_\_\_\_ = \$0.64

\_\_\_\_\_

6 10 \_\_\_\_\_  $\times$  10 = \$1.00

\_\_\_\_\_

7 8 hours  $\times$  3 = \_\_\_\_\_ minutes

\_\_\_\_\_

8 3 \_\_\_\_\_ + 5 \_\_\_\_\_ = 26 \_\_\_\_\_

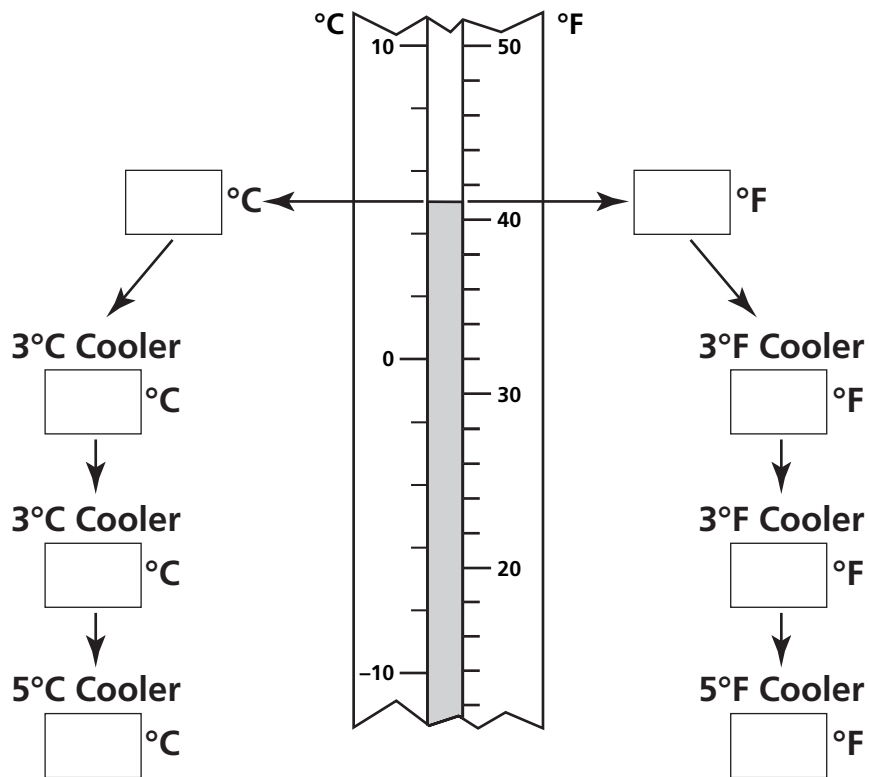
\_\_\_\_\_

9 54 \_\_\_\_\_ - 2 \_\_\_\_\_ = 40 \_\_\_\_\_

# Measuring Temperature

This thermometer has two different units of measure.

Use the picture to help you find the answers.



Which is colder, your final temperature in °C or your final temperature in °F? Explain your answer.

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# Measuring Length

1 Write  $<$ ,  $>$ , or  $=$ .

$$15 \text{ inches } \bigcirc 1\frac{1}{2} \text{ feet}$$

$$\frac{5}{12} \text{ foot } \bigcirc 3 \text{ inches}$$

$$\frac{2}{7} \text{ foot } \bigcirc \frac{5}{7} \text{ foot}$$

$$\frac{1}{6} \text{ foot } \bigcirc \frac{3}{12} \text{ foot}$$

$$36 \text{ inches } \bigcirc 3 \text{ feet}$$

$$1 \text{ yard } \bigcirc 2\frac{2}{3} \text{ feet}$$

2 Solve.

Jason measured the lengths of the walls in our rectangular classroom. One wall was 13 feet 5 inches long, and another wall was 17 feet 3 inches long.

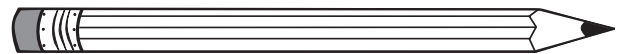
What was the perimeter of the classroom floor?

Explain how you found your answer.

\_\_\_\_\_ feet \_\_\_\_\_ inches

3 Solve.

Juanita wants to find the length of her pencil. She knows that the paper clip is 1 inch long, and that the string is  $2\frac{1}{2}$  paper clips long. She also knows that the string is half the length of the pencil. How long is her pencil? Explain how you found your answer.



# Measuring in Inches, Feet, and Yards

Write the measurement numbers or units.

❶  $2\frac{2}{3}$  feet = \_\_\_\_\_ inches

❷  $3\frac{1}{2}$  yards =  $10\frac{1}{2}$  \_\_\_\_\_

❸ 1.5 yards = \_\_\_\_\_ inches

❹  $4\frac{1}{2}$  yards = \_\_\_\_\_

❺  $3\frac{1}{4}$  feet = \_\_\_\_\_ inches

❻ 5 feet = \_\_\_\_\_ yards

❼ 50 inches = \_\_\_\_\_ feet

❽  $3\frac{3}{4}$  yards = \_\_\_\_\_

❾  $1\frac{1}{3}$  feet = 16 \_\_\_\_\_

❿ 6.5 feet = \_\_\_\_\_ inches

⓫  $2\frac{1}{4}$  yards = \_\_\_\_\_

⓬ 42 inches =  $1\frac{1}{6}$  \_\_\_\_\_

⓭ 54 inches = \_\_\_\_\_

⓮ 7 feet 6 inches = \_\_\_\_\_ yards

# Measuring Length in Centimeters

Complete the tables.

**1**

Meters	1	2	3	4	5	6	7	8
Centimeters								

**2**

Meters	5	10	15	20	25	30	35	40
Centimeters								

**3**

Meters	0	$\frac{1}{2}$	1	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Centimeters								

**4**

Kilometers	1	2	3	4	5	6	7	8
Meters	1,000							

**5**

Kilometers	2	4	6	8	10	12	14	16
Meters								

**6**

Kilometers	0	$\frac{1}{2}$	1	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Meters								



# Measuring Capacity in Cups, Pints, and Quarts

Andre is trying to measure various amounts, but he has only the following containers:

a bowl that holds exactly 3 cups of liquid

a 1-pint container

a  $1\frac{1}{2}$ -cup mug

---

❶ How can Andre accurately measure 1 cup of milk?

---

---

---

---

❷ How can Andre accurately measure  $2\frac{1}{2}$  cups of milk?

---

---

---

---

---

# Measuring Capacity in Gallons and Liters

**Circle the larger amount.**

❶ 4 cups or 1 pint

❷ 1 gallon or 10 cups

❸ 1 gallon or  $2\frac{1}{2}$  pints

❹  $2\frac{1}{2}$  pints or  $1\frac{1}{2}$  quarts

❺  $1\frac{7}{8}$  cups or  $1\frac{1}{9}$  pints

❻  $15\frac{7}{9}$  cups or 1 gallon

❼  $\frac{1}{2}$  gallon or 2 liters

❽ 10 pints or  $4\frac{1}{2}$  quarts

❾  $3\frac{1}{4}$  pints or  $1\frac{1}{2}$  quarts

❿  $4\frac{1}{4}$  quarts or  $15\frac{3}{4}$  cups

⓫ Fill in the missing numbers.

1 cup = \_\_\_\_\_ pint = \_\_\_\_\_ quart = \_\_\_\_\_ gallon

2 cups = \_\_\_\_\_ pint = \_\_\_\_\_ quart = \_\_\_\_\_ gallon

3 cups = \_\_\_\_\_ pints = \_\_\_\_\_ quart = \_\_\_\_\_ gallon

4 cups = \_\_\_\_\_ pints = \_\_\_\_\_ quart = \_\_\_\_\_ gallon

# Computing Amounts of Liquid

1 Convert this recipe so that the amounts are in cups.

1 quart orange juice = \_\_\_\_\_ cups orange juice

3 pints grapefruit juice = \_\_\_\_\_ cups grapefruit juice

$\frac{1}{2}$  quart pineapple juice = \_\_\_\_\_ cups pineapple juice

$\frac{1}{2}$  pint papaya juice = \_\_\_\_\_ cup papaya juice

2 Complete this table so that each column contains equivalent amounts.

Cups	1	2	3					8	
Pints	$\frac{1}{2}$				$2\frac{1}{2}$				
Quarts	$\frac{1}{4}$			1		$1\frac{1}{2}$	$1\frac{3}{4}$		10

3 Solve.

Allen drank 1 liter of water, Josh drank 2 pints of water, and Alex drank 3 cups of water. Praveen drank the least water and Ross drank the most. How much water might Ross and Praveen have had?

Ross:	Praveen:
_____	_____
_____	_____
_____	_____
_____	_____

# Measuring Weight in Ounces, Pounds, and Tons

**Use a calculator to solve each problem.**

There are 60 seconds in a minute.

1 How many seconds are in an hour? \_\_\_\_\_

---

2 How many seconds are in a day? \_\_\_\_\_

---

3 How many seconds are in a week? \_\_\_\_\_

---

4 How many seconds are in a year? \_\_\_\_\_

---

A bag of chips weighs 8 ounces.

5 How many bags of chips weigh 10 pounds? \_\_\_\_\_

---

6 How many bags of chips weigh 1,000 pounds? \_\_\_\_\_

---

7 How many bags of chips weigh 1 ton? \_\_\_\_\_

# Measuring Weight in Grams and Kilograms

Compare. Fill in  $>$ ,  $<$ , or  $=$ .

1 1 gram  1 pound

2 2 kilograms  2 pounds

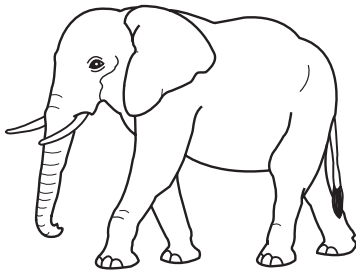
3 10 grams  1 ounce

4 1 kilogram  1 ton

5 15 ounces   $\frac{1}{2}$  kilogram

6 2 tons  3,082 pounds

7 Is the weight reasonable? Circle yes or no.  
If you circle no, give a reasonable weight.

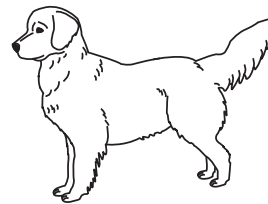


10 pounds

yes or no

Reasonable weight

\_\_\_\_\_



1 ton

yes or no

Reasonable weight

\_\_\_\_\_



8 ounces

yes or no

Reasonable weight

\_\_\_\_\_



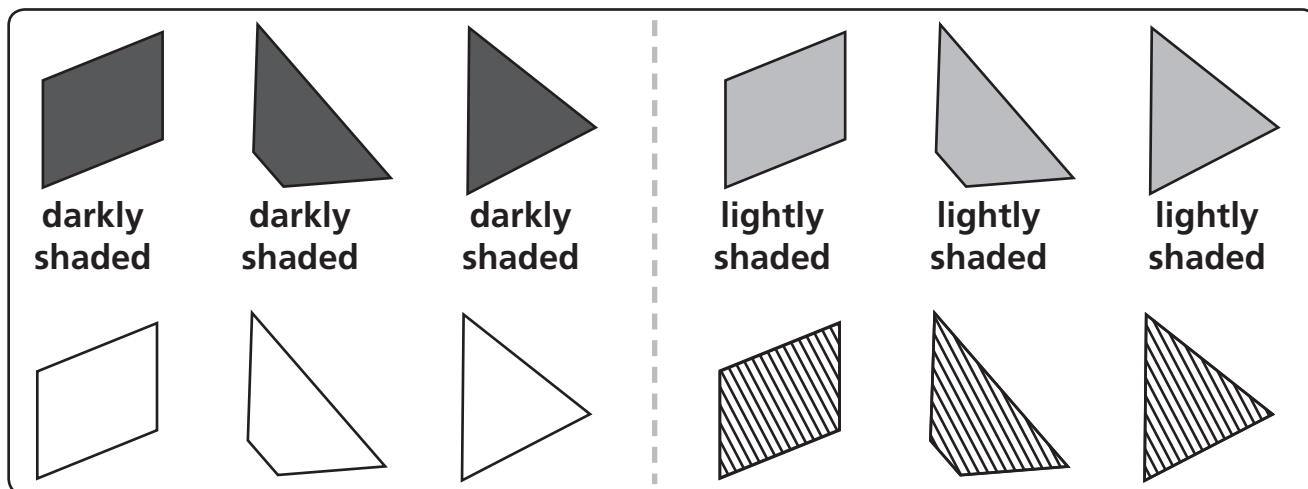
7 pounds

yes or no

Reasonable weight

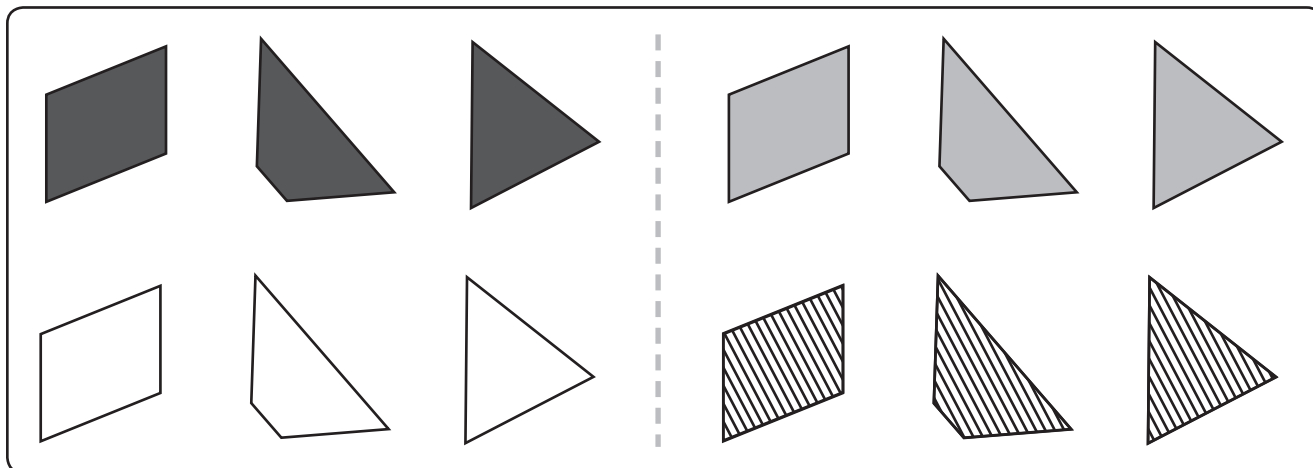
\_\_\_\_\_

# Finding Combinations of Attributes



- 1 What portion of the cards have a trapezoid without stripes? \_\_\_\_\_ out of \_\_\_\_\_
- 2 What portion of the cards have a darkly or lightly shaded parallelogram? \_\_\_\_\_
- 3 What portion of the cards have a darkly shaded triangle? \_\_\_\_\_
- 4 Describe a kind of card that appears in the deck fewer times than the darkly or lightly shaded parallelogram. \_\_\_\_\_
- 5 Describe a kind of card that appears 4 times out of the 12 cards. \_\_\_\_\_
- 6 Describe a kind of card that appears 8 times out of the 12 cards. \_\_\_\_\_

# Describing the Likelihood of An Event



**Complete each sentence in two ways:**

**1** 4 out of 12 cards

have a parallelogram

---

---

---

**2**  $\frac{3}{12}$  of the cards

---

---

---

**3**  $\frac{1}{2}$  of the cards

---

---

---

**4** If you draw one card,  
it is likely that the card

---

---

---

# Introducing Probability

**Use your deck of attribute cards to follow these steps and answer each question.**

**1** What portion of the cards are striped blue? \_\_\_\_\_ out of \_\_\_\_\_

**2** If you draw one card, what is the probability that it will be striped blue? \_\_\_\_\_

---

**Remove the solid blue triangle from the deck and put it aside.**

**3** What portion of the remaining cards are striped blue? \_\_\_\_\_ out of \_\_\_\_\_

**4** If you draw one card now, what is the probability that it will be striped blue? \_\_\_\_\_

---

**Now, remove the green striped parallelogram and the solid green trapezoid and put them aside.**

**5** Now what portion of the cards are striped blue? \_\_\_\_\_ out of \_\_\_\_\_

**6** If you draw one card now, what is the probability that it will be striped blue? \_\_\_\_\_

---

**7** Which is more likely: drawing a striped blue card from the deck as it is now, or drawing a striped blue card from the full deck you started with? Explain your answer.

---

---



# Drawing From a Deck of Attribute Cards

**Imagine a bag of 12 marbles. Some are red, some are yellow, and some are blue.**

- ① If you know that 6 marbles are red and 3 are blue, \_\_\_\_\_ out of \_\_\_\_\_ then what portion are yellow?

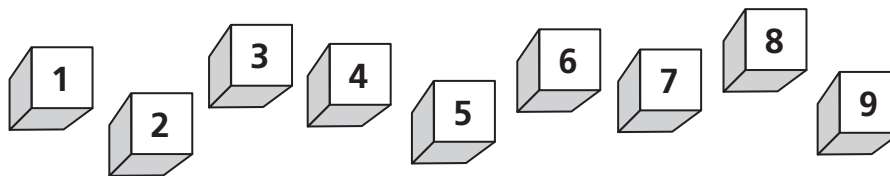
- ② If 4 marbles are yellow, what portion of the marbles are not yellow? \_\_\_\_\_ out of \_\_\_\_\_

- ③ If the probability of picking a red marble out of the bag is  $\frac{1}{2}$ , what is the probability of picking a marble that is not red? \_\_\_\_\_

- ④ If the probability of picking a blue marble out of the bag is  $\frac{4}{12}$  and the probability of picking a yellow marble is  $\frac{4}{12}$ , what is the probability of picking a red marble? \_\_\_\_\_

- ⑤ If  $\frac{1}{2}$  of the marbles are red and  $\frac{1}{4}$  are blue, what is the probability of picking a yellow marble? \_\_\_\_\_

# Drawing Blocks



- 1 What portion of the blocks are numbered with multiples of 3? \_\_\_\_\_ out of \_\_\_\_\_

- 2 If you pick one block without looking, what is the probability that it will be a multiple of 3? \_\_\_\_\_

- 3 Imagine doing an experiment in which you pick a block at random 30 times. How many times would you expect to pick a multiple of 3? \_\_\_\_\_

- 4 If you did this experiment and picked a multiple of 3 3 times out of 30, would you be surprised? Why or why not?

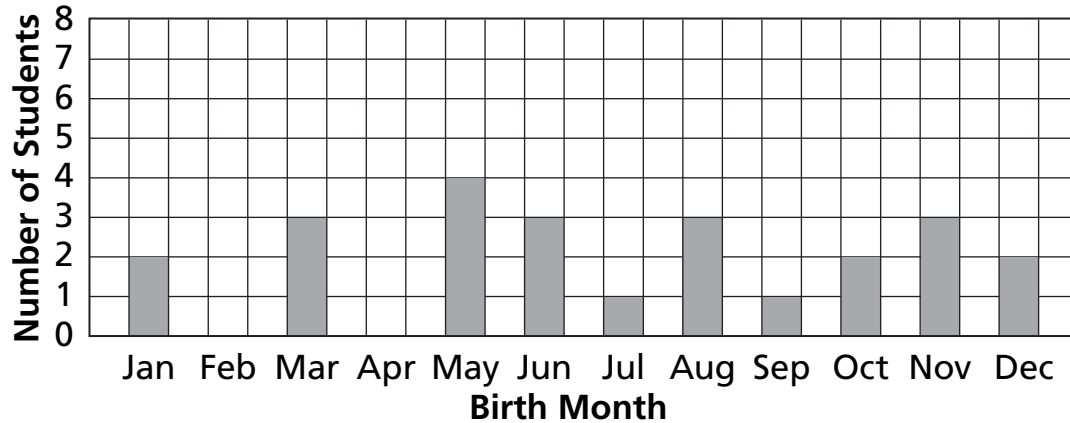
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# Collecting and Analyzing Survey Data

Mr. Gottlieb's class made a graph of the months students were born in.



- ❶ Looking at this graph, can you tell whether more students were born in winter than in summer? Explain.

---

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---

- ❷ Looking at this graph, can you tell whether more boys than girls were born in May? Explain.

---

- ❸ Write three pieces of information you know from looking at this graph.

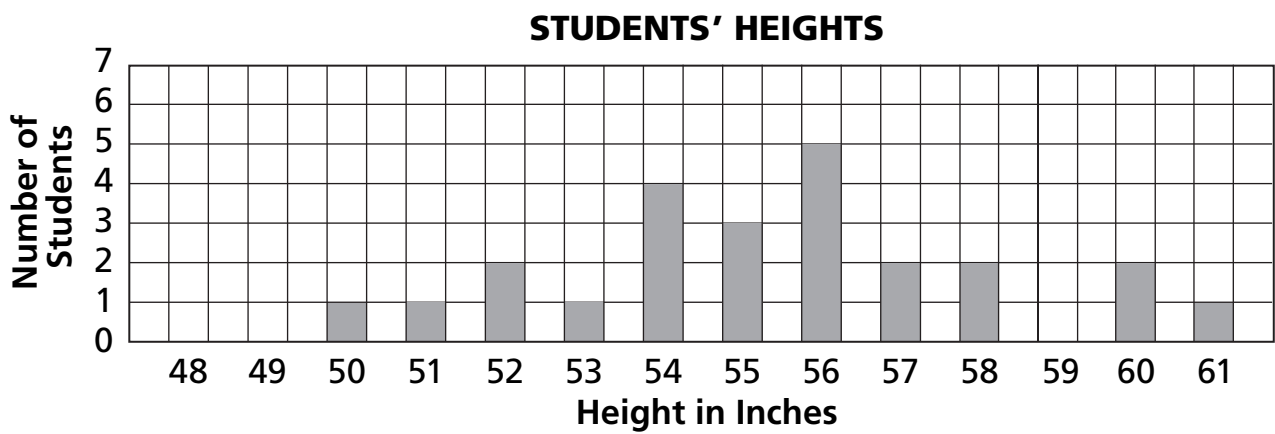
1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

# Collecting Measurement Data

Here is a graph of the heights of the students in Dana’s class.



Clues
Dana is shorter than at least half the students in the class.
Dana’s height is one of the three most common heights.
At least one other student is the same height as Dana.
There are more students Dana’s height than students 1 inch shorter than Dana.

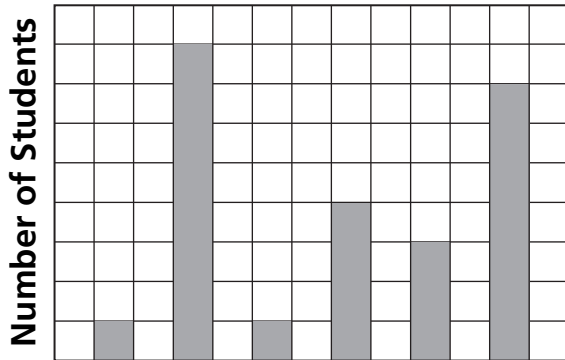
Use the clues to figure out how tall Dana is.

Dana is \_\_\_\_\_ inches tall.

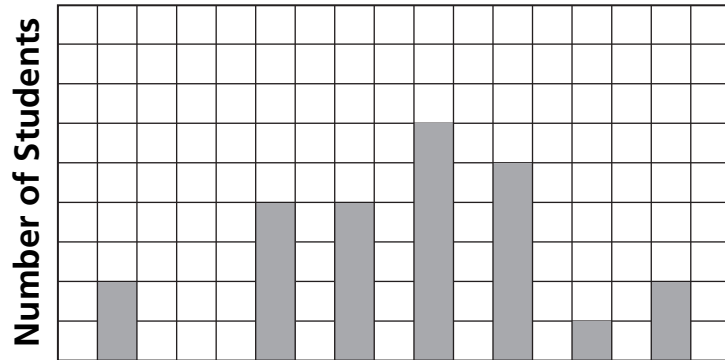
# Analyzing Measurement Data

Jeremy surveyed his classmates about their heights and their favorite sports, but he forgot to label the graphs. The heights were listed in order from shortest to tallest. The sports were listed in alphabetical order.

**GRAPH #1**



**GRAPH #2**



**1** Which label do you think belongs with each graph?

\_\_\_\_\_ goes with Graph # \_\_\_\_\_

\_\_\_\_\_ goes with Graph # \_\_\_\_\_

**2** Explain your answer to Problem 1.

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# Making a Figure Zoo

**Each picture is a net, showing an unfolded polyhedron.**

- 1 The face labeled F is a square.

Besides the square, what other figures make up the faces of this polyhedron?

\_\_\_\_\_

- 2 What type of angle is in face F?

\_\_\_\_\_

- 3 What type of angle does each non-square face contain?

\_\_\_\_\_

- 4 Circle a pair of parallel edges on the net.

- 5 The faces labeled with an H are parallelograms.

What types of angles does face H contain?

\_\_\_\_\_ and \_\_\_\_\_

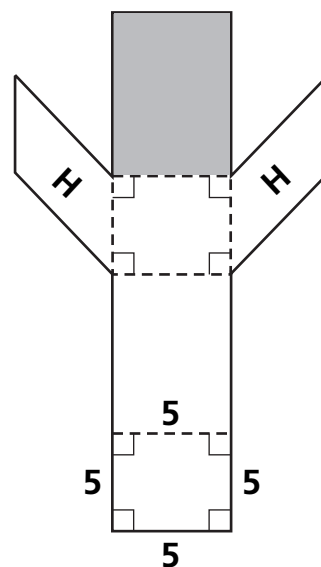
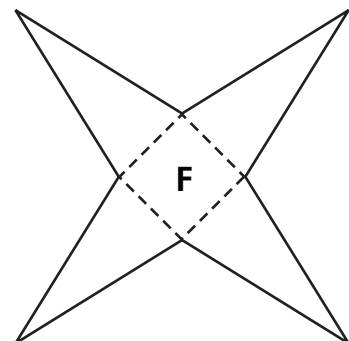
- 6 What other figures make up the faces of this polyhedron?

\_\_\_\_\_ and \_\_\_\_\_

- 7 What type of angle does the shaded face contain?

\_\_\_\_\_

- 8 Circle a pair of perpendicular edges on the edges of the net.



# Describing Three-Dimensional Figures

1 Describe a prism.

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2 Describe a pyramid.

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3 What are some differences between a prism and pyramid?

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4 What are some similarities between a prism and pyramid?

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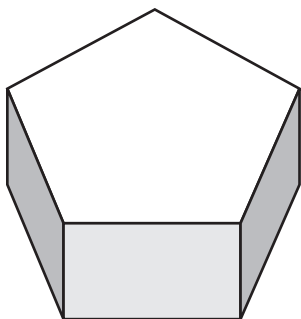
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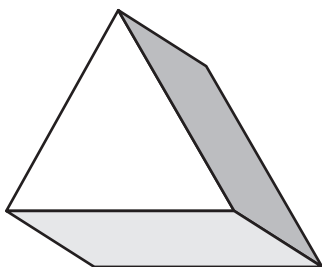
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# Going On a Figure Safari

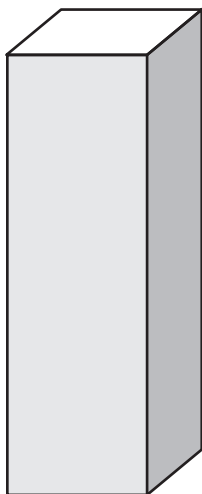
Write 3 clues that describe each of these figures.

**1****A** \_\_\_\_\_**B** \_\_\_\_\_**C** \_\_\_\_\_

Could your clues describe another figure, in addition to the one shown?

**yes****or****no****2****A** \_\_\_\_\_**B** \_\_\_\_\_**C** \_\_\_\_\_

Could your clues describe another figure, in addition to the one shown?

**yes****or****no****3****A** \_\_\_\_\_**B** \_\_\_\_\_**C** \_\_\_\_\_

Could your clues describe another figure, in addition to the one shown?

**yes****or****no**



# Finding the Area of Faces on Three-Dimensional Figures

**Complete the first problem. Then use your answer to complete the second and third problems.**

- 1 Mr. Garcia's classroom has four walls. He wants his class to make a mural for one of the walls. He cuts two large pieces of paper that are 24 feet long and 4 feet high. After students decorate the papers, he will tape them together and put them up so that the entire wall is covered. What is the area of the entire mural?

- 
- 2 There are 24 students in Mr. Garcia's class. To be fair, he will draw lines on the mural papers to split them up so that each student has the same amount of paper to draw on. How much space should each student get?

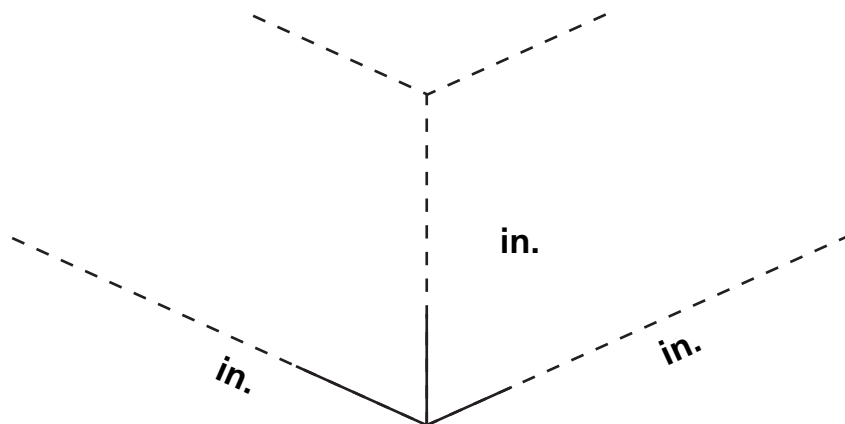
- 
- 3 What might be the dimensions of the space each student receives for drawing?

\_\_\_\_\_ ft × \_\_\_\_\_ ft

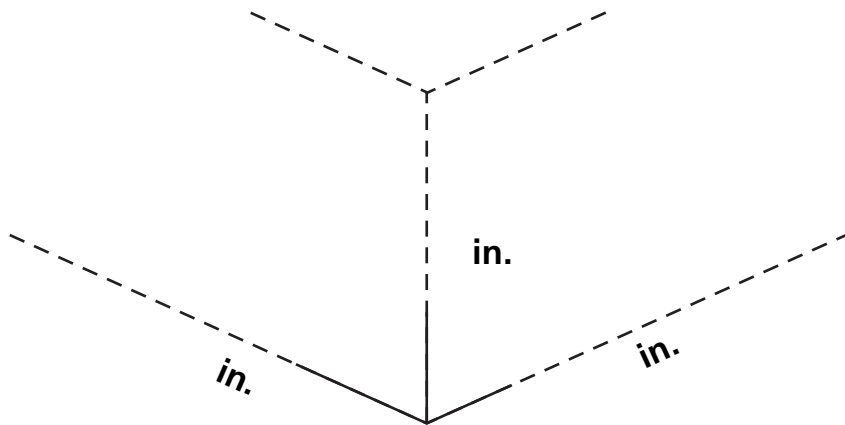
# Finding Volumes of Three-Dimensional Figures

Selby built a rectangular prism out of twenty-four inch cubes. What might be the dimensions of the prism? Fill in different dimensions for each picture.

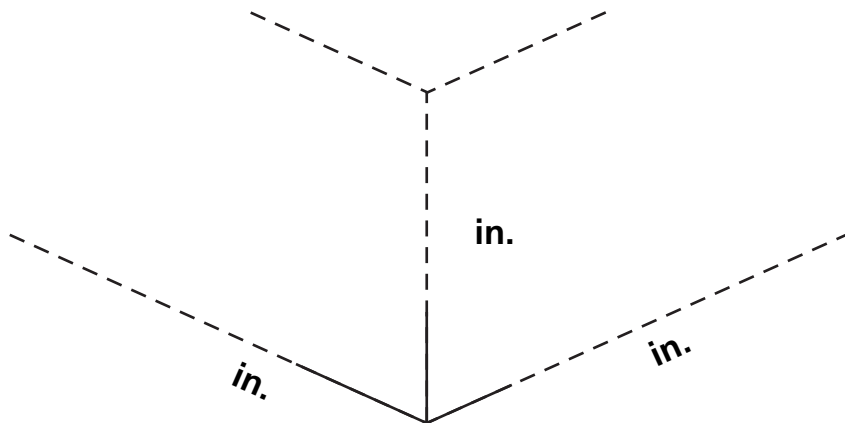
1



2

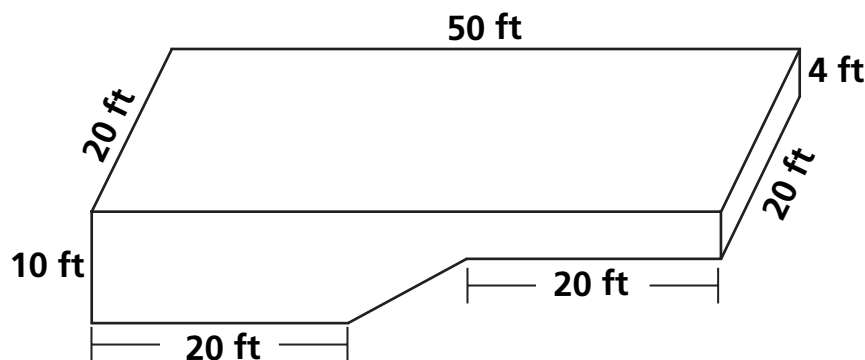


3



# More Volumes of Three-Dimensional Figures

- 1 What is the volume of the pool shown here?



Hint: You haven't been taught how to solve this problem, so you will have to invent a method of your own.

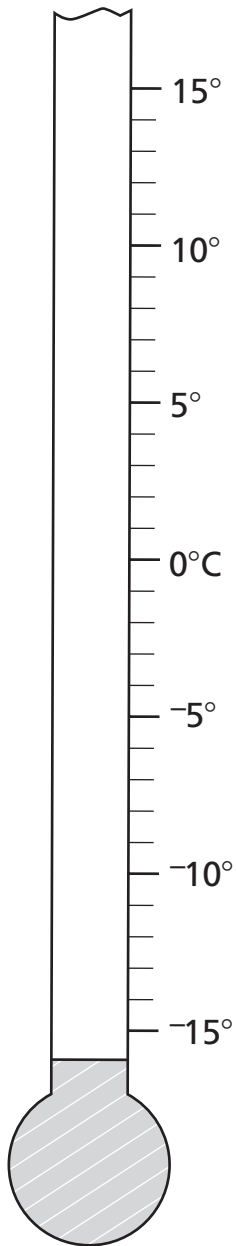
Here are three ideas. You'll have to decide whether they are useful or not.

- Imagine freezing the water of the pool into a block of ice. Try to picture cutting the ice into three prisms.
- For one piece of ice, try to picture combining two of those pieces to make one rectangular prism. What would the volume of that prism be?
- What is a reasonable *estimate* of the volume? What must it be more than? What must it be less than?

\_\_\_\_\_ cubic feet

# Introducing Negative Numbers

Draw a line from each clue to the temperature it describes.



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**A**

6 degrees lower than 9°C

Temperature A = \_\_\_\_\_ °C

**B**

15 degrees lower than Temperature E

Temperature B = \_\_\_\_\_ °C

**C**

5 degrees higher than Temperature F

Temperature C = \_\_\_\_\_ °C

**D**

10 degrees lower than Temperature A

Temperature D = \_\_\_\_\_ °C

**E**

7 degrees higher than Temperature A

Temperature E = \_\_\_\_\_ °C

**F**

3 degrees higher than Temperature D

Temperature F = \_\_\_\_\_ °C

**G**

8 degrees lower than Temperature B

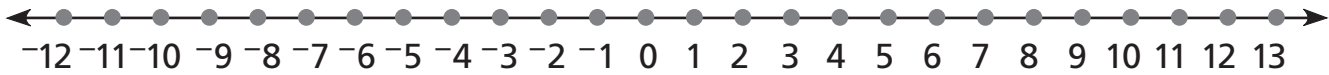
Temperature G = \_\_\_\_\_ °C

**H**

16 degrees lower than Temperature E

Temperature H = \_\_\_\_\_ °C

# Negative Numbers on the Number Line



Use this number line to help you answer the questions. Fill in the number sentences to show what you did.

- ① Start at 4. Jump backward 4 spaces. Then jump backward 3 spaces.

Where are you? \_\_\_\_\_

$$\boxed{4} \bigcirc \boxed{4} \bigcirc \boxed{3} = \boxed{\phantom{00}}$$

- ② Start at -6. Jump forward 7 spaces. Then jump backward 2 spaces.

Where are you? \_\_\_\_\_

$$\boxed{\phantom{00}} \bigcirc \boxed{\phantom{00}} \bigcirc \boxed{\phantom{00}} = \boxed{\phantom{00}}$$

- ③ Start at 6. Jump forward 3 spaces. Then jump backward 6 spaces.

Where are you? \_\_\_\_\_

$$\boxed{\phantom{00}} \bigcirc \boxed{\phantom{00}} \bigcirc \boxed{\phantom{00}} = \boxed{\phantom{00}}$$

- ④ Start at 3. Jump forward 6 spaces. Then jump backward 9 spaces.

Where are you? \_\_\_\_\_

$$\boxed{\phantom{00}} \bigcirc \boxed{\phantom{00}} \bigcirc \boxed{\phantom{00}} = \boxed{\phantom{00}}$$

- ⑤ Start at  $2\frac{1}{2}$ . Jump backward 4 spaces. Then jump forward 1 space.

Where are you? \_\_\_\_\_

$$\boxed{\phantom{00}} \bigcirc \boxed{\phantom{00}} \bigcirc \boxed{\phantom{00}} = \boxed{\phantom{00}}$$

- ⑥ Start at 6.75. Jump forward 3 spaces. Then jump backward 12 spaces.

Where are you? \_\_\_\_\_

$$\boxed{\phantom{00}} \bigcirc \boxed{\phantom{00}} \bigcirc \boxed{\phantom{00}} = \boxed{\phantom{00}}$$

- ⑦ Start at 0. Jump forward 3 spaces. Then jump forward 3 half spaces.

Where are you? \_\_\_\_\_

$$\boxed{\phantom{00}} \bigcirc \boxed{\phantom{00}} \bigcirc \boxed{\phantom{00}} = \boxed{\phantom{00}}$$

- ⑧ Start at  $-3\frac{1}{2}$ . Jump forward 3 half spaces. Then jump backward 3 whole spaces.

Where are you? \_\_\_\_\_

$$\boxed{\phantom{00}} \bigcirc \boxed{\phantom{00}} \bigcirc \boxed{\phantom{00}} = \boxed{\phantom{00}}$$

# Navigating on a Coordinate Grid

Aaron made these cards to remind him how to get from his house to some new places. Aaron's house is at  $(0,0)$ .

Doctor
$(2,7)$

Dentist
$(2,-6)$

Movie Theater
$(-6,4)$

Laundromat
$(-7,-4)$

- 1 Without looking at the map, how can you use these cards to figure out how many blocks Aaron must walk to get from his house to the doctor's office?

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- 2 How many blocks must Aaron walk to get from the doctor to the dentist? Explain how you know.

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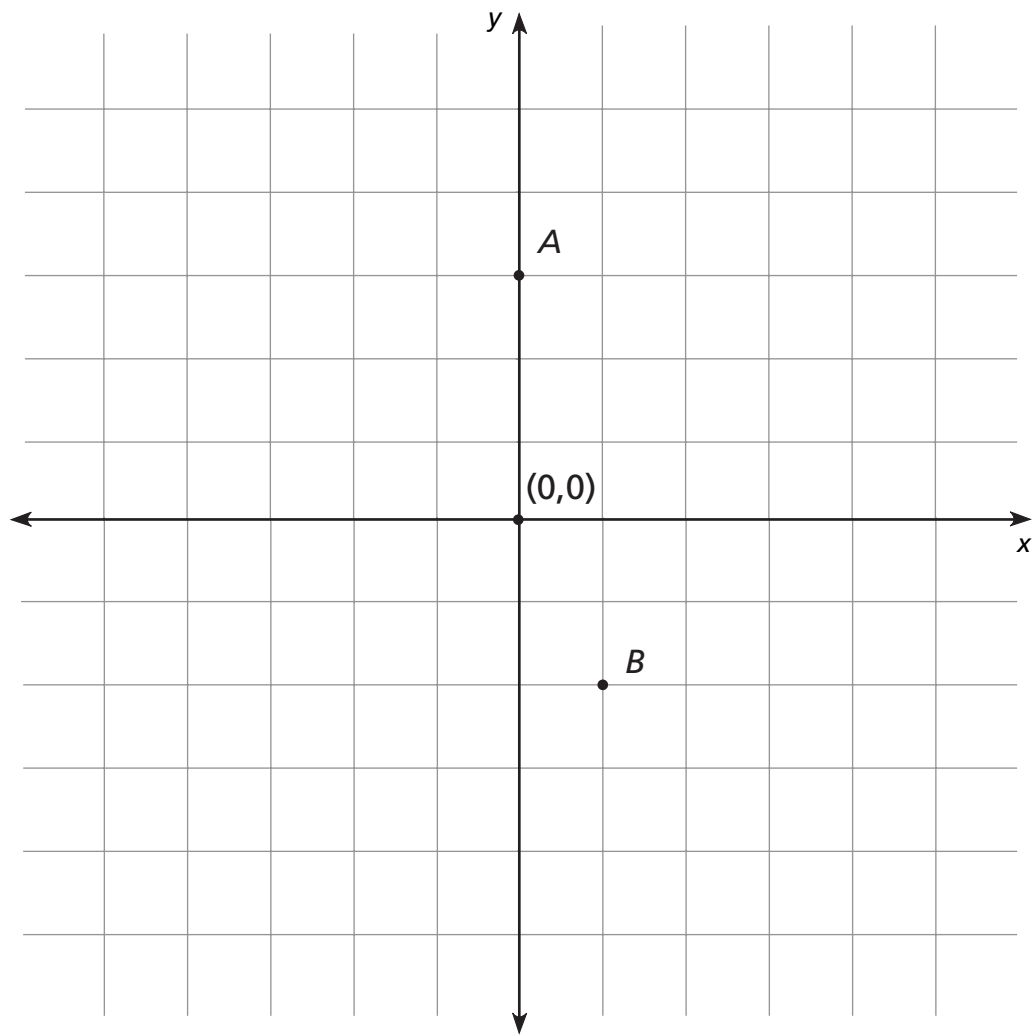
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# Points and Lines on a Grid



**The taxi station is at (0,0). Point A is 3 blocks from the taxi station. So is point B.**

Find all the other points that are 3 blocks from the taxi station. (Remember that the taxi can drive only along horizontal and vertical streets, not diagonally!)

Mark each point on the grid and write the coordinates of each point in this table.

(0,3)	(1,-2)						

# Drawing Figures on a Coordinate Grid

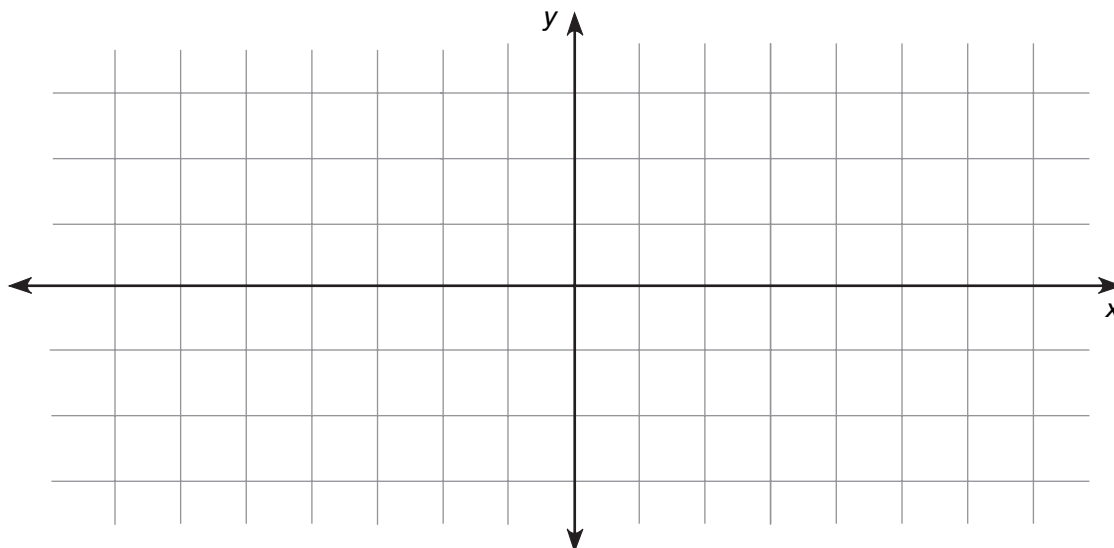
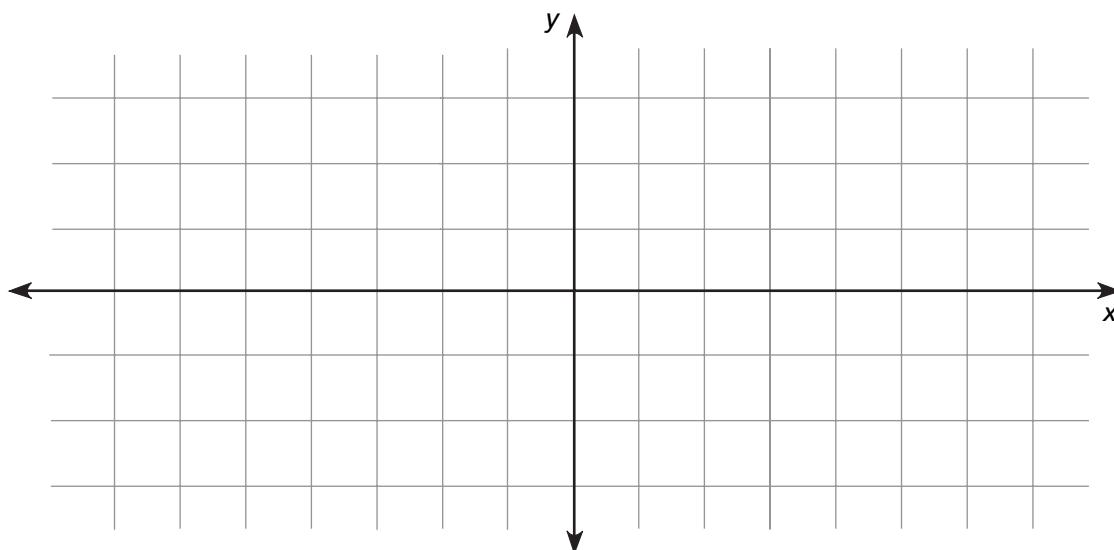
**On each grid, make a figure following these rules:**

The figure is square.

No two of the points at the four corners of the square may have the same vertical coordinates.

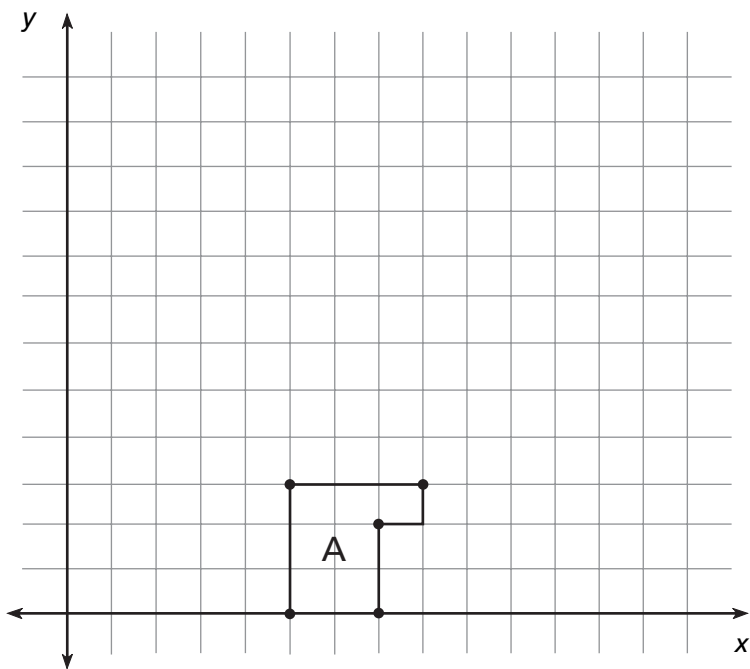
No two of the points at the four corners of the square may have the same horizontal coordinate.

Find a different way to do this on each grid.

**1****2**



# Moving Figures on a Coordinate Grid



Translate, reflect, or rotate Figure A to draw two new figures on the grid. Label the new Figures B and C. In the tables below, record the coordinates of the points in the new figures.

A	B	C
(5,0)		
(7,0)		
(7,2)		
(8,2)		
(8,3)		
(5,3)		

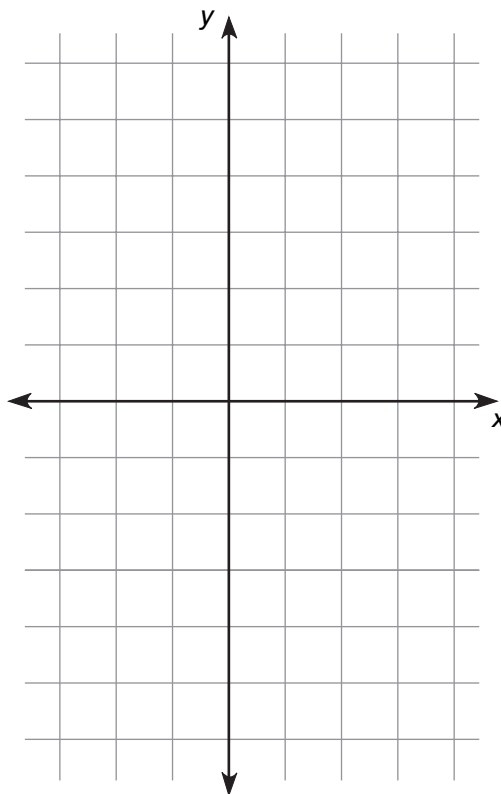
# Number Sentences and Straight Lines

**Mark the first two points and draw a line.**

**Then complete the table and find a rule**

**to describe the points on this line.**

$(x,y)$
$(0,0)$
$(1,2)$
$(2, \underline{\hspace{1cm}})$
$(10, \underline{\hspace{1cm}})$
$(-2, \underline{\hspace{1cm}})$
$(-6, \underline{\hspace{1cm}})$
$(\frac{1}{2}, \underline{\hspace{1cm}})$



Describe your rule with words or symbols.

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# Finding Missing Dimensions

Fill in the missing numbers.

**1**

	2	
	×	7
		5

**2**

		0
	×	2
	8	

**3**

	×	
1	9	1

**4**

	2	0
×		5
3		

**5**

	2	6
×	3	1

**6**

	3	0
×		
9	0	0

**7**

	1	9
×	4	7

**8**

	3	8
×	2	1

**9**

	1	5
×		
2	2	5

**10**

	×	2
6	0	0

**11**

		5	0
	×		
2	5	0	0

**12**

	1	1	8
	×	2	2

# Finding Missing Factors

Find the missing factor. Use any numbers you want to build it.

1

$$8 \times \underline{\hspace{1cm}} = 104$$

2

$$9 \times \underline{\hspace{1cm}} = 135$$

3

$$\underline{\hspace{1cm}} \times 7 = 98$$

4

$$26 \times 13 = \underline{\hspace{1cm}}$$

5

$$32 \times 16 = \underline{\hspace{1cm}}$$

6

$$19 \times \underline{\hspace{1cm}} = 399$$

## Solve.

Sam is making a collage using 4-inch by 6-inch photographs. He bought a rectangular frame that is big enough to hold 18 of his photographs. What might the dimensions of the frame be?

\_\_\_\_\_ inches by \_\_\_\_\_ inches

# Finding Missing Factors More Efficiently

Answer the questions.

**Suzanna ordered 6 pizzas for her birthday party. She wants all 15 people at the party to get the same number of slices.**

- ➊ Into how many slices should she ask the pizza parlor to cut each pizza?

\_\_\_\_\_

- ➋ How many slices will each person at the party receive?

\_\_\_\_\_  
\_\_\_\_\_

**Raul works in a clothing store. He's arranging a shipment of 360 shirts evenly onto 12 shelves.**

- ➌ How many shirts should he put on each shelf?

\_\_\_\_\_  
\_\_\_\_\_

- ➍ Uh oh! Two of the shelves broke and dropped all of their shirts. Raul will stack those evenly on the remaining shelves. How many shirts will be on each shelf then?

\_\_\_\_\_  
\_\_\_\_\_

- ➎ The most shirts that can fit on a shelf is 58. If Raul has 12 shelves to use, how many more shirts can he order to fill the shelves?

\_\_\_\_\_  
\_\_\_\_\_

# Estimating Missing Factors and Quotients

Rewrite each division sentence as a multiplication sentence to help you complete the problems. Then use multiples of 10 and smaller multiplication facts to build the missing factor and quotient.

**1**

$$470 \div \square = 10$$

$$\boxed{10} \times \square = \boxed{470}$$

$$10 \times \square = \square$$

$$10 \times \square = \square$$

$$\square$$

**2**

$$414 \div \square = 18$$

$$\square \times \square = \square$$

$$18 \times \square = \square$$

$$18 \times \square = \square$$

$$\square$$

**3**

$$399 \div \square = 19$$

$$\square \times \square = \square$$

$$19 \times \square = \square$$

$$19 \times \square = \square$$

$$\square$$

**4**

$$783 \div 27 = \underline{\hspace{2cm}}$$

**5**

$$348 \div \underline{\hspace{2cm}} = 12$$

**6**

$$966 \div \underline{\hspace{2cm}} = 42$$

# Dividing Using Multiplication Puzzles

Use the largest number possible from the chart at each step.

0	1	2	3	4	5	6	7	8	9
0	10	20	30	40	50	60	70	80	90

<b>1</b> <div style="text-align: right;"> <div style="border: 1px solid black; width: 30px; height: 30px; margin-bottom: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 30px;"></div> </div> <div style="text-align: right; margin-top: 10px;"> <math>11 \overline{) 583}</math> </div>	<b>2</b> <div style="text-align: right;"> <div style="border: 1px solid black; width: 30px; height: 30px; margin-bottom: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 30px;"></div> </div> <div style="text-align: right; margin-top: 10px;"> <math>24 \overline{) 312}</math> </div>	<b>3</b> <div style="text-align: right;"> <div style="border: 1px solid black; width: 30px; height: 30px; margin-bottom: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 30px;"></div> </div> <div style="text-align: right; margin-top: 10px;"> <math>35 \overline{) 1,155}</math> </div>
$11 \times \square = \bigcirc$	$24 \times \square = \bigcirc$	$35 \times \square = \bigcirc$
<div style="text-align: center;"> <div style="border: 1px dashed black; width: 60px; height: 20px; margin: 0 auto;"></div> </div>	<div style="text-align: center;"> <div style="border: 1px dashed black; width: 60px; height: 20px; margin: 0 auto;"></div> </div>	<div style="text-align: center;"> <div style="border: 1px dashed black; width: 60px; height: 20px; margin: 0 auto;"></div> </div>
$11 \times \square = \bigcirc$	$24 \times \square = \bigcirc$	$35 \times \square = \bigcirc$
<div style="text-align: center;"> <div style="border: 1px dashed black; width: 60px; height: 20px; margin: 0 auto;"></div> </div>	<div style="text-align: center;"> <div style="border: 1px dashed black; width: 60px; height: 20px; margin: 0 auto;"></div> </div>	<div style="text-align: center;"> <div style="border: 1px dashed black; width: 60px; height: 20px; margin: 0 auto;"></div> </div>
$583 \div 11 = \bigcirc$	$312 \div 24 = \bigcirc$	$1,155 \div 35 = \bigcirc$
<b>4</b> <div style="text-align: right;"> <div style="border: 1px solid black; width: 30px; height: 30px; margin-bottom: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 30px;"></div> </div> <div style="text-align: right; margin-top: 10px;"> <math>72 \overline{) 2,664}</math> </div>	<b>5</b> <div style="text-align: right;"> <div style="border: 1px solid black; width: 30px; height: 30px; margin-bottom: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 30px;"></div> </div> <div style="text-align: right; margin-top: 10px;"> <math>105 \overline{) 2,625}</math> </div>	<b>6</b> <div style="text-align: right;"> <div style="border: 1px solid black; width: 30px; height: 30px; margin-bottom: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 30px;"></div> </div> <div style="text-align: right; margin-top: 10px;"> <math>39 \overline{) 1,404}</math> </div>
$72 \times \square = \bigcirc$	$105 \times \square = \bigcirc$	$39 \times \square = \bigcirc$
<div style="text-align: center;"> <div style="border: 1px dashed black; width: 60px; height: 20px; margin: 0 auto;"></div> </div>	<div style="text-align: center;"> <div style="border: 1px dashed black; width: 60px; height: 20px; margin: 0 auto;"></div> </div>	<div style="text-align: center;"> <div style="border: 1px dashed black; width: 60px; height: 20px; margin: 0 auto;"></div> </div>
$72 \times \square = \bigcirc$	$105 \times \square = \bigcirc$	$39 \times \square = \bigcirc$
<div style="text-align: center;"> <div style="border: 1px dashed black; width: 60px; height: 20px; margin: 0 auto;"></div> </div>	<div style="text-align: center;"> <div style="border: 1px dashed black; width: 60px; height: 20px; margin: 0 auto;"></div> </div>	<div style="text-align: center;"> <div style="border: 1px dashed black; width: 60px; height: 20px; margin: 0 auto;"></div> </div>
$2,664 \div 72 = \bigcirc$	$2,625 \div 105 = \bigcirc$	$1,404 \div 39 = \bigcirc$

# Completing Division Sentences

Complete the problems.

1

$$8 \overline{) 872}$$

$$872 \div 8 = \underline{\hspace{2cm}}$$

2

$$9 \overline{) 819}$$

$$819 \div 9 = \underline{\hspace{2cm}}$$

3

$$9 \overline{) 1,287}$$

$$1,287 \div 9 = \underline{\hspace{2cm}}$$

The students in Miss Sterling's class were sponsored for a read-a-thon. For every book they read, they received 1 quarter. By the end of the read-a-thon, the class had read 129 books. The class decided to buy 7 new books with the money they raised.

- 4 If each book costs the same amount, what is the most each one could cost?

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- 5 Describe how students can divide up the money in order to buy each book separately. (Note: They can't just divide the quarters into 7 equal groups.)

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# Number Puzzles

1 Complete the puzzles.

**A**  $(0 \times 3) \div 2 = \square$

**D**  $(3 \times 6) \div 2 = \square$

**G**  $(6 \times 9) \div 2 = \square$

**B**  $(1 \times 4) \div 2 = \square$

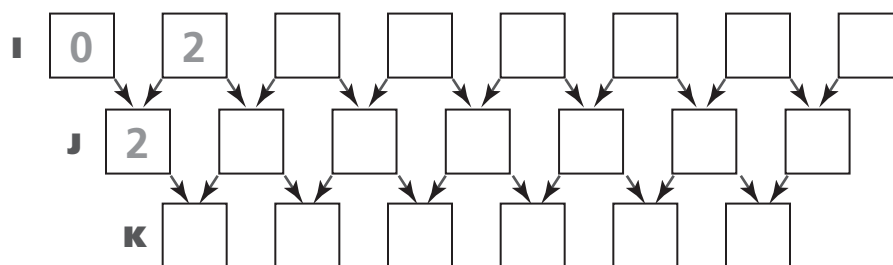
**E**  $(4 \times 7) \div 2 = \square$

**H**  $(7 \times 10) \div 2 = \square$

**C**  $(2 \times 5) \div 2 = \square$

**F**  $(5 \times 8) \div 2 = \square$

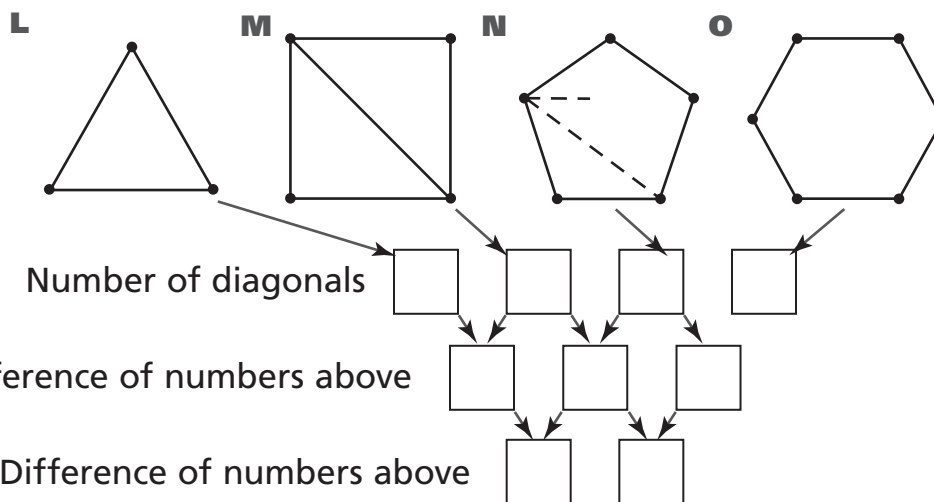
2 Fill in your answers to A through H in Row I.



In Row J, record the differences of the numbers in Row I.

In Row K, record the differences of the numbers in Row J.

Draw all possible diagonals connecting the dots in each of the figures below. Record the numbers of diagonals in the boxes.



Have you seen similar results before? \_\_\_\_\_

# Introducing Variables

Write words that match the letter pattern.

**1**

abbc (The middle 2 letters are the same.)



meet

room

**2**

rstr (The first and last letters are the same.)



lull

**3**

abcc

**4**

abcdd

**5**

grsst

# Introducing a Shorthand Notation

- 1 Record each word from the list beneath the pattern where it fits. Some words are already recorded.

Words: meet, tree, miss, that, sits, boat, gong, lull, noon, deed, room, muff, Anna

ABBC	RSTR	ABCC	XYXX	ZMMZ
meet				deed

- 2 Create your own pattern. Record two words that fit your pattern.

Pattern: \_\_\_\_\_

Words: \_\_\_\_\_  
\_\_\_\_\_

# Using Shorthand Notation to Complete Number Puzzles

Complete the puzzle.

Words	Shorthand	A	B	C	D
Think of a number.	$x$				
Add 9.	$x + 9$				
	$2x + 18$		26		150
Add the number you thought of first.					
Divide by 3.				20	
Add 10.		26			82
Double.					
Subtract the number you thought of first.					
Subtract 25.					
	7				

# Using Square Numbers to Remember Other Multiplication Facts

Complete the related number sentences.

1

$$50 \times 50 = \boxed{\phantom{000}}$$

$$49 \times 51 = \bigcirc$$

2

$$40 \times 40 = \boxed{\phantom{000}}$$

$$39 \times 41 = \bigcirc$$

3

$$51 \times 51 = \boxed{\phantom{000}}$$

$$50 \times 52 = \bigcirc$$

4

$$39 \times 39 = \boxed{\phantom{000}}$$

$$38 \times 40 = \bigcirc$$

5

$$100 \times 100 = \boxed{\phantom{000}}$$

$$99 \times 101 = \bigcirc$$

6

$$\boxed{\phantom{000}} \times \boxed{\phantom{000}} = 784$$

$$27 \times 29 = \bigcirc$$

7

$$\boxed{\phantom{000}} \times \boxed{\phantom{000}} = 361$$

$$\bigcirc \times 20 = 360$$

8

$$\boxed{\phantom{000}} \times \boxed{\phantom{000}} = 225$$

$$14 \times \bigcirc = 224$$

9

$$\boxed{\phantom{000}} \times \boxed{\phantom{000}} = 484$$

$$\bigcirc \times \bigcirc = 483$$

10

$$\boxed{\phantom{000}} \times \boxed{\phantom{000}} = 961$$

$$\bigcirc \times \bigcirc = 960$$

# Generalizing a Multiplication Pattern

Complete the puzzles.

1	Words	Shorthand	Ben	Al	Mary	Jane
	Think of a number.	$n$	4	3	2	5
	Multiply your number by itself.	$n \cdot n$	16			
	Subtract 4 from the product.	$(n \cdot n) - 4$				
	Add 2 to your number.	$n + 2$	6			
	Subtract 2 from your number.	$n - 2$	2			
	Multiply your results together.	$(n - 2) \cdot (n - 2)$				

2	Words	Shorthand	Ben	Al	Mary	Jane
	Think of a number.	$n$	7	4	3	5
	Multiply your number by itself.	$n \cdot n$				
	Subtract 9 from the product.	$(n \cdot n) - 9$				
	Add 3 to your number.	$n + 3$				
	Subtract 3 from your number.	$n - 3$				
	Multiply your results together.	$(n + 3) \cdot (n - 3)$				

# Estimation Strategies

These division problems have remainders.  
Estimate their quotients.

**1**  $23 \div 3 = \blacksquare$

Estimate: \_\_\_\_\_

**2**  $23 \div 4 = \blacksquare$

Estimate: \_\_\_\_\_

**3**  $23 \div 5 = \blacksquare$

Estimate: \_\_\_\_\_

**4** 
$$\begin{array}{r} \blacksquare \\ 5 \overline{) 24} \end{array}$$

Estimate: \_\_\_\_\_

**5** 
$$\begin{array}{r} \blacksquare \\ 3 \overline{) 25} \end{array}$$

Estimate: \_\_\_\_\_

**6** 
$$\begin{array}{r} \blacksquare \\ 3 \overline{) 40} \end{array}$$

Estimate: \_\_\_\_\_

**7**  $38 \div 7 = \blacksquare$

Estimate: \_\_\_\_\_

**8**  $25 \div 7 = \blacksquare$

Estimate: \_\_\_\_\_

**9**  $41 \div 7 = \blacksquare$

Estimate: \_\_\_\_\_

**10** 
$$\begin{array}{r} \blacksquare \\ 7 \overline{) 62} \end{array}$$

Estimate: \_\_\_\_\_

**11** 
$$\begin{array}{r} \blacksquare \\ 9 \overline{) 62} \end{array}$$

Estimate: \_\_\_\_\_

**12** 
$$\begin{array}{r} \blacksquare \\ 9 \overline{) 87} \end{array}$$

Estimate: \_\_\_\_\_

# Estimating and Checking Length and Perimeter

If all you have available are: a 1-foot length of string, an 8-inch stick, and a 15-inch strip of paper, how can you cut the following lengths of ribbon?

- 1 20 inches of ribbon

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- 2 4 inches of ribbon

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- 3 7 inches of ribbon

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- 4 3 inches of ribbon

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- 5 19 inches of ribbon

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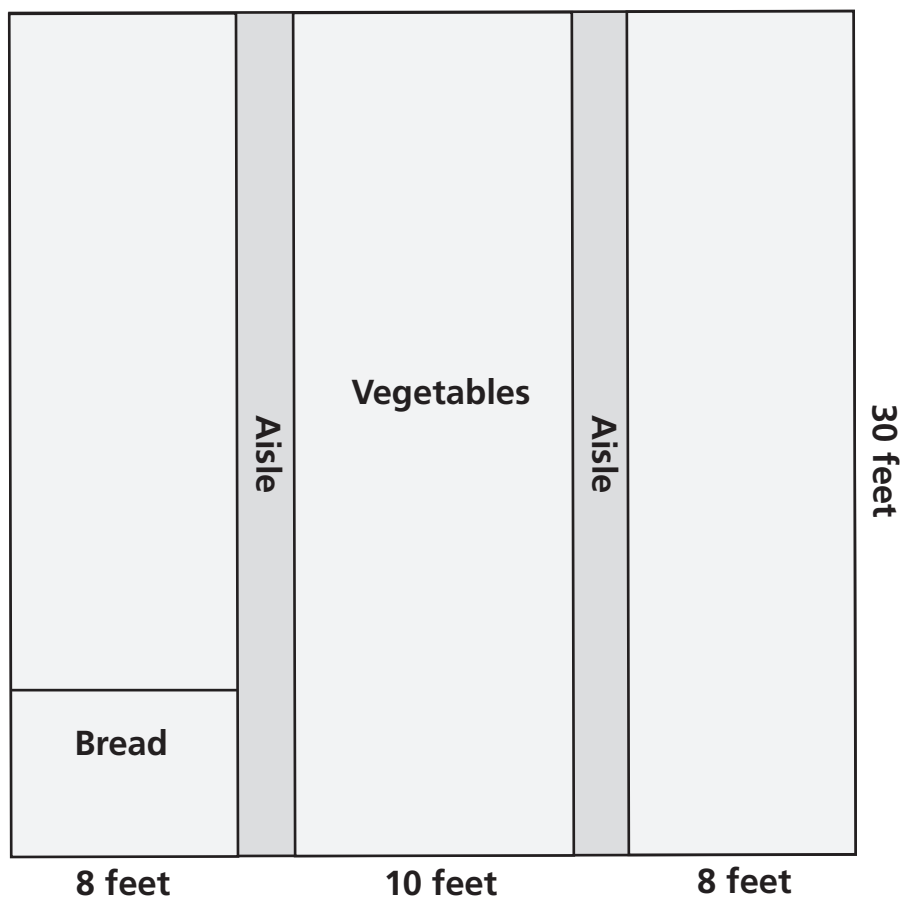
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# Designing a School

Use a ruler to fill in the floor plan according to these requirements:

- There are sections for meat, vegetables, fruit, cereal, bread, and drinks.
- The perimeter of the fruit section is about 46 feet.
- The section for vegetables has more area than the section for cereal.
- The bread section has the smallest area and perimeter.
- The area of the meat section is almost 120 square feet.
- The perimeter of the drinks section is less than the perimeter of the meat section.



# Estimating and Checking Capacity

**Jefferson County had to drain its 100,000-gallon lake to get rid of some of the algae growing in it. They want to transport the water to a treatment facility. They are deciding how many trucks will be needed for the transport.**

- 1 If each truck can hold 500 gallons of water, how many trucks will they need?

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\_\_\_\_\_ trucks

- 2 The treatment facility is very close to the lake. If each truck makes 2 trips from the lake to the facility, how many trucks will be needed?

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\_\_\_\_\_ trucks

- 3 The cost of renting a truck is \$1,000 for the first hour and \$500 for each additional hour. It takes 1 hour for a truck to fill up with water, drive to the facility, empty the water, and drive back to the lake. To spend the least amount of money, should Jefferson County have the same trucks do more than 1 trip? Explain.

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# Comparing Units of Capacity

The corner store sells water in various sizes.

Use the chart to answer the questions.

12 ounces	\$0.59	20 ounces	\$0.99
1 liter	\$1.18	2 liters	\$1.85
1 gallon	\$2.99	5 gallons	\$8.00

- 1 Jason needs about  $1\frac{1}{2}$  gallons of water. What sizes should he buy so that he spends the least amount of money? How much will his purchase cost?

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- 2 Shadae needed less than 5 gallons of water. She bought 5 gallons because it was less expensive. About how much water might she have needed? Explain your answer.

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- 3 Austin spent about \$6 at the store. What might he have purchased?

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# Estimating and Checking Weight

**Answer these questions. Remember that an object's weight on the Moon is about  $\frac{1}{6}$  of its weight on Earth, and that an object's weight on Jupiter is about 300 times its weight on Earth.**

- 1 If a bowling ball weighs 12 pounds on Earth,  
how much will it weigh . . . on the Moon? \_\_\_\_\_ pounds  
on Jupiter? \_\_\_\_\_ pounds

- 
- 2 If Tom weighs 30 pounds on the Moon,  
how much would he weigh . . . on Earth? \_\_\_\_\_ pounds  
on Jupiter? \_\_\_\_\_ pounds

- 
- 3 If a car weighs 900,000 pounds on Jupiter,  
how much would it weigh . . . on Earth? \_\_\_\_\_ pounds  
on the Moon? \_\_\_\_\_ pounds

# Comparing Units of Weight

Write the name of an object that weighs close to the given weight.

1 100 grams

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2 12 ounces

---

3 1 pound

---

4 10 pounds

---

5 100 pounds

---

6 10 kilograms

backpack stuffed with books

7 70 kilograms

---

8 100 kilograms

---

9 1 ton

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10 5 tons

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# Using Equations to Estimate

**Solve.**

- 1 If 8 bags weigh 10 kg and 7 boxes weigh 11 kg, which is heavier, a bag or a box?

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- 2 If 12 bags weigh 20 kg and 15 boxes weigh 30 kg, which is heavier, a bag or a box?

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- 3 If 21 bags weigh 15 lb and 19 boxes weigh 16 lb, which is heavier, a bag or a box?

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- 4 If 5 bags weigh 6 lb and 6 boxes weigh 5 lb, which is heavier, a bag or a box?

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- 5 If 16 bags weigh 4 lb and 24 boxes weigh 8 lb, which is heavier, a bag or a box?

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- 6 If 10 bags weigh 9 lb and 11 boxes weigh 10 lb, which is heavier, a bag or a box?

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